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NAPOLI

THE
HISTORY,
OF THE
ROYAL SOCIETY of LONDON
FOR IMPROVING OF
NATURAL KNOWLEDGE,
FROM ITS FIRST RISE.

IN WHICH

The moſt conſiderable of thoſe Papers communicated to the Society, which have hitherto not been publiſhed, are inſerted in their proper order,

AS A SUPPLEMENT TO

THE PHILOSOPHICAL TRANSACTIONS.

By THOMAS BIRCH, D.D.
Secretary to the Royal Society.

VOL. I.

Talem intelligo Philosophiam Naturalem, *quæ non abeat in fumos ſpeculationum ſubtilium aut ſublimium, ſed quæ efficaciter operetur ad ſublevanda vitæ humanæ incommoda.* Bacon de Augm. Scient. L. ii. c. 2.

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MDCCLVI.

NAPOLI

TO THE

KING.

SIR,

A Former Work with this title had the honour of being introduced to the world under the protection of one of your Majeſty's Royal Predeceſſors, the Founder of the Society, whoſe Hiſtory that Work began. The preſent performance, intended to proſecute the ſame deſign, preſumes therefore, with the greater confidence, to offer itſelf to Your Majesty, the PATRON of that Society; a title, which you were pleaſed, ſoon after your acceſſion to the throne, to add to your name in their Charter-book, wherein you had before ſubſcribed it as a Member. Your Majesty's regard for that learned body is founded upon your thorough conviction of the importance of Experimental Philoſophy and real Science to the intereſt of every Nation; and how much the cultivation of them has raiſed the reputation of your own kingdoms. And, in conſequence of this, your Majesty had no ſooner received an application from the Society in favour of the Royal Obſervatory, than you granted a very conſiderable ſum for an additional building, and a complete apparatus of inſtruments; and ſhortly after took occaſion, by an ample and unſolicited penſion, to reward the diſtinguiſhed merit of your aſtronomer.

These, Sir, are topics, which have a peculiar propriety before a Work of the kind now preſented. Civil Hiſtory will claim, as her province, the other more illuſtrious Acts of your Majesty, for the inſtruction and emulation of ſucceeding Princes. But duty as well as inclination engage me to embrace this opportunity of declaring my grateful ſenſe of that happineſs, which, for the greater part of my life, I have enjoyed, in common with all your ſubjects, under your Majesty's wiſe, juſt, and amiable government. I know I expreſs their united wiſhes, when I add my own, for the long continuance of your Majesty's health and reign.

I am,

SIR,

Your Majesty's moſt humble,

moſt faithfull,

and moſt devoted ſubject,

London,
10 November,
1755.

THOMAS BIRCH.

THE

PREFACE.

THOUGH the deſign of continuing the HISTORY OF THE ROYAL SOCIETY from the year 1667, in which that of biſhop SPRAT was publiſhed, can want no apology, if the execution of it ſhall in any meaſure correſpond with the dignity of the ſubject; yet as the preſent work profeſſes to trace it back through a period, which has been already treated of by that excellent writer, it will undoubtedly be expected of me to premiſe the grounds of that part of my undertaking.

Admired as his performance is in general, eſpecially the review contained in it of antient and modern philoſophy, and the defence and recommendation of experimental knowledge, the great object of the Royal Society; the earlieſt and ableſt members of that body[*], as well as their ſucceſſors, ſtill wiſhed, that the account of its inſtitution and progreſs had been more full and circumſtantial in the narration of the facts related by him, and inlarged by inſerting many others of equal importance, which were omitted; and that the order of time, in which they occurred, had been more exactly marked.

This conſideration, added to the motives of gratitude for the honour done me by the Society in electing me one of their ſecretaries, and of zeal for the intereſt of ſcience in general, induced me to attempt the compiling from the original journals, regiſters, letter and council-books both a ſupplement to biſhop SPRAT's *Hiſtory*, and a continuation of it, illuſtrated with many other particulars relating to the ſubject from manuſcript and printed authorities, with the addition of the moſt important papers communicated to the Society, which have not yet been publiſhed. And of theſe there is no inconſiderable number, as the PHILOSOPHICAL TRANSACTIONS were not begun till March 166$\frac{4}{5}$, about four years after the Society's journals and regiſter-books commence; and as the publication of thoſe TRANSACTIONS was diſcontinued for four years from January 167$\frac{8}{9}$ to January 168$\frac{2}{3}$, though ſupplied in ſome meaſure by Mr. HOOKE's PHILOSOPHICAL COLLECTIONS; and for three years from December 1687 to January 169$\frac{0}{1}$, beſides other ſmaller interruptions amounting to near one year and a half more, before October 1695, ſince which time the TRANSACTIONS have been regularly carried on. The whole is digeſted into a chronological order, as moſt proper for aſcertaining the origin and improvements of the ſeveral diſcoveries in nature and inventions of art, and for doing juſtice to the claims of their reſpective authors.

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[*] See Mr. BOYLE's Works, vol. v. p. 325 and 367.

The two firſt volumes are now offered to the public, from whoſe candor I hope, that induſtry and fidelity, the moſt eſſential qualifications in a work of this kind, will atone for the want of that beauty of ſtyle, copiouſneſs of imagination, and force of eloquence ſo eminent in the great prelate already mentioned; which were indeed more neceſſary in his time for vindicating the inſtitution of the Society from the clamors of ignorance, prejudice, and bigotry, than they are in this more ſober and inlightned age for repreſenting the detail of its performances, the plaineſt account of which is perhaps preferable to the moſt elaborate ornaments.

No fact has been omitted, which appeared to me important in itſelf or by its connexion with others, that are ſo. The failure of experiments is recorded as well as their ſucceſs. And I have been not in the leaſt ſolicitous to ſuppreſs, in the earlier part of this work, ſome few traces of falſe though received opinions; ſince it will be found, that the mention of them in the Society was generally followed by ſo ſtrict and judicious an examination of them, as ended in their confutation. My great aim has indeed been to give the hiſtory of the ROYAL SOCIETY the extent due to ſo copious a ſubject, as it is in fact the hiſtory of philoſophy in the laſt and preſent age. And the account, which I have added towards the cloſe of every year, of the moſt eminent members, who died in it, is a ſmall tribute to the memory of thoſe men, to whoſe genius and labours the Society owes its glory, and the public the various improvements of real ſcience and the moſt uſeful knowledge.

THE HISTORY OF THE ROYAL SOCIETY of LONDON, FOR IMPROVING OF NATURAL KNOWLEDGE, FROM ITS FIRST RISE.

THE riſe of the Royal Society is traced by Dr. SPRAT[a] no higher than *ſome ſpace after the end of the civil wars*; the ſcene of the firſt aſſemblies of the learned men, who laid the foundation of it, being fixed by him in the univerſity of Oxford at the lodgings of Dr. JOHN WILKINS in Wadham College. But we may go ſtill farther back for the origin of this excellent inſtitution, upon the authority of Dr. JOHN WALLIS, one of its earlieſt and moſt conſiderable members. It was, according to his account[b], about the year 1645, that ſeveral worthy perſons reſiding in London, who were inquiſitive into natural, and the new and experimental philoſophy, agreed to meet weekly on a certain day, to diſcourſe upon ſuch ſubjects[c]. Among theſe were Dr. JOHN WILKINS, Dr. WALLIS,

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[a] Hiſtory of the Royal Society, part ii. p. 53: edit. 1667.

[b] Dr. WALLIS's account of his own life, in the preface to Mr. THOMAS HEARNE's edition of PETER LANGTOFT's chronicle, vol. i. p. 161.

[c] It is evident from hence and from other authorities and facts, that Monſieur DU HAMEL was very ill-informed in the following paſſage of his *Regiæ ſcientiarum academiæ hiſtoria*, lib i. cap. 2. § 12. p. 8. edit. Paris 1698, in 4to. *Sub finem dominationis* OLIVARII CROMVELII *complures viri nobiles, quibus & hæ diſciplinæ cordi erant, quique magnâ ex parte Galliam & Italiam peragrârunt, atque eruditorum cœtui apud D. D.* MONTMOR & THEVENOT *interfuerant, Oxonii unà convenerunt, qui de rebus phyſicis inter ſe conferrent, & varia facerent experimenta. Præterquam enim earum diſciplinarum, quas in dies perpoliri cernebant, ſtudio tenebantur, illud quoque vel maximum accedebat, quod legitimo ſuo regi addicti minus tutum iis videretur domi ſuæ quietos agere, quaſi præſenti rerum ſtatu minus contenti opportunum tempus tyranni jugum excutiendi*

Dr. **JONATHAN GODDARD**, then candidate, and afterwards fellow of the college of phyſicians, Dr. **GEORGE ENT**, Dr. **FRANCIS GLISSON**, and Dr. **CHRISTOPHER MERRET**, doctors in phyſic; Mr. **SAMUEL FOSTER**, profeſſor of aſtronomy in Greſham College; Mr. **THEODORE HAAK**, a native of the Palatinate in Germany, who firſt gave occaſion to, and ſuggeſted theſe meetings; and many others. The aſſemblies were held ſometimes at Dr. **GODDARD**'s lodgings in Woodſtreet, on account of his keeping an operator in his houſe for grinding glaſſes for teleſcopes; ſometimes at a convenient place in Cheapſide, and ſometimes in Greſham College, or in the neighbourhood of it. The buſineſs was, precluding affairs of ſtate and queſtions of theology, to conſider and diſcuſs philoſophical ſubjects, and whatever had any connection with, or relation to them, as phyſic, anatomy, geometry, aſtronomy, navigation, ſtatics, magnetiſm, chemiſtry, mechanics, and natural experiments, with the ſtate of theſe ſtudies, as then cultivated at home or abroad.

This aſſembly ſeems to be that mentioned under the title of the *Inviſible* or *Philoſophical College* by Mr. **BOYLE** in ſome letters of his written in 1646 and 1647[d].

About the years 1648 and 1649 the company, who formed theſe meetings, began to be divided; Dr. **WILKINS** being appointed warden of Wadham College on the 13th of April 1648[e]; Dr. **WALLIS**, Savilian profeſſor of geometry in June 1649[f]; and Dr. **GODDARD**, warden of Merton College, 9th of December 1651[g]. Thoſe in London continued to meet there as before; and the Oxford members joined them, as often as buſineſs or inclination brought them to the metropolis. The latter, in conjunction with Dr. **SETH WARD**, then Savilian profeſſor of aſtronomy, and afterwards ſucceſſively biſhop of Exeter and Saliſbury, **RALPH BATHURST**, M. D. afterwards preſident of Trinity College and dean of Wells, Dr. **WILLIAM PETTY**, Dr. **THOMAS WILLIS**, then an eminent phyſician at Oxford, and divers others, continuing their aſſemblies in Oxford, brought the ſtudy of natural and experimental philoſophy into faſhion there, meeting at firſt in Dr. **PETTY**'s lodgings, in the houſe of an apothecary, for the convenience of inſpecting drugs, &c. as there was occaſion. After his departure in September 1652[h] to Ireland, they met, though not ſo conſtantly as before[i], at Dr. **WILKINS**'s apartments in Wadham College; and, upon his being made maſter of Trinity College in Cambridge, whither he removed in September 1659[k], in the lodgings of the honourable Mr. **ROBERT BOYLE**, who had come to

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cutie di expectarent. Eâ ratione minui poſſe periculoſam CROMWELLII *de ſe ſuſpicionem, ſi hiis ſtudiis ſe dederent, quæ tranquillitatem animi & ſecuritatem poſtulant.* The learned hiſtorian has committed here a groſs miſtake in fixing the time of the firſt meetings of the Engliſh philoſophers ſo late as the latter end of OLIVER CROMWELL's government, and aſſigning as one cauſe of their application to philoſophical ſtudies the view of avoiding his jealouſy of their ill affection to him; whereas the fact is, that they had begun their meetings eight years before he aſſumed the power of protector. Nor is it true, what Monſieur DU HAMEL aſſerts, that *moſt* of them had, before they formed themſelves into a ſociety at Oxford, travelled into France, and been preſent at the aſſemblies of learned men at Monſieur MONTMOR's and Monſieur THEVENOT's at Paris.

[d] The life of the honourable ROBERT BOYLE, p. 66, 67. and 78. edit. London, 1744, in 8vo.

[e] WOOD, Ath. Oxon. vol. ii. fol. 505. 2d. edit.

[f] Id. Hiſt. & Antiq. univerſ Oxon. lib. ii. p 42.

[g] WARD's lives of the profeſſors of Greſham College, p. 270.

[h] Ibid. p. 218.

[i] Dr. PETTY, in a letter to Mr. BOYLE, from Dublin, Feb 17, $165\frac{7}{8}$, has theſe words: "I "have not heard better news, than that the club "is reſtored at Oxford." See Mr. BOYLE's works, vol. v. p. 298.

[k] Ibid. p 406.

Oxford in the latter end of June 1654, and reſided there for the moſt part till April 1668, when he ſettled in London[l].

The greateſt part of the Oxford ſociety coming to London about the year 1659[m], they uſually met at Greſham College at the Wedneſday's lecture upon aſtronomy by Mr. Christopher Wren, at the Thurſday's upon geometry by Mr. Laurence Rooke; where they were joined by William lord viſcount Brouncker, William Brereton, eſq; afterwards lord Brereton, Sir Paul Neile, John Evelyn, eſq; Thomas Henshaw, eſq; Henry Slingesby, eſq; Dr. Timothy Clarke, Dr. Ent, William Balle, eſq; Abraham Hill, eſq; Mr. (afterwards Dr.) William Croune, and divers other gentlemen, whoſe inclinations lay the ſame way.

They continued their cuſtom of meeting once, if not twice, a week in term-time, till they were ſcattered by the public diſtractions of that year 1659, and the place of their meeting was made a quarter for ſoldiers[n].

Their meetings were revived, and attended with a larger concourſe of perſons, eminent for their characters and learning, upon the reſtoration, 1660[o]; and, as appears from the journal book of the Royal Society[p], on the 28th of November that year, the lord viſcount Brouncker, Mr. Boyle, Mr. Bruce, Sir Robert Moray, Sir Paul Neile, Dr. Wilkins, Dr. Goddard, Dr. Petty, Mr. Balle, Mr. Rooke, Mr. Wren, and Mr. Hill, after the lecture of Mr. Wren at Greſham College, withdrew, for mutual converſation, into Mr. Rooke's apartment, where, amongſt other matters diſcourſed of, ſomething was offered about a deſign of founding a college for the promoting of phyſico-mathematical experimental learning. And becauſe they had theſe frequent occaſions of meeting with one another, it was propoſed, that ſome courſe might be thought of to improve this meeting to a more regular way of debating things; and that, according to the manner in other countries, where there were voluntary aſſociations of men into academies for the advancement of various parts of learning, they might do ſomething anſwerable here for the promoting of experimental philoſophy.

In order to this, it was therefore agreed, that the company would continue their weekly meetings on Wedneſdays, at three of the clock in the afternoon in term-time, at Mr. Rooke's chamber in Greſham College, and in the vacation at that of Mr. Balle's in the Temple: and that, towards the defraying of occaſional expences, every one ſhould, at his firſt admiſſion, pay down ten ſhillings; and beſides, engage to pay one ſhilling weekly, whether preſent or abſent, whilſt he ſhould pleaſe to keep his relation to the company.

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[l] Life of Mr. Boyle, p. 109.

[m] Dr Sprat p. 57, ſays, 1658, and p. 58, that the ſociety continued to meet at Greſham College, till they were ſcattered by the *miſerable diſtractions of that fatal year, the place of their meeting being made a quarter for ſoldiers.* But he has evidently miſtaken the year 1658 for 1659, in which theſe *diſtractions* happened after Richard Cromwell had reſigned the protectorſhip in May of the latter year; nor was Greſham College poſſeſſed by the ſoldiers till October following, as appears from a letter of Mr. Matthew Wren to his couſin Mr. Christopher Wren then at Oxford, dated the 25th of that month, and printed in the *Parentalia or memorials of the lives of biſhop* Wren, *&c.* part i. app. which letter muſt have been written in 1659, as it mentions likewiſe ſerjeant Bradshaw as *going into another world*, who, according to Whitlock's Memorials, p. 686, died on the 31ſt of that month.

[n] Dr. Sprat, p. 57, 58.

[o] Dr. Wallis, *ubi ſupra.*

[p] Vol. i. p. 1.

At this meeting, Dr. Wilkins was appointed to the chair; Mr. Balle to be treaſurer; and Mr. Croune, though abſent, was named regiſter.

And to the end that they might the better be enabled to make conjecture, of how many the elected members of the ſociety ſhould conſiſt, it was deſired, that a liſt might be taken of the names of ſuch perſons, as were known to thoſe preſent, and judged by them willing and fit to be joined with them in their deſign; and who, if they ſhould deſire it, might be admitted before any others.

Upon which the following catalogue was offered:

Lord Hatton
Mr. Robert Boyle
Mr. Jones
Mr. Coventry
Mr. Brereton
Sir Kenelme Digby
Sir Anthony Morgan
Mr. John Vaughan
Mr. Evelyn
Mr. Rawlins
Mr. Matthew Wren
Mr. Slingesby
Mr. Henshaw
Mr. Denham
Mr. Povey
Mr. Wylde
Dr. Ward
Dr. Wallis
Dr. Glisson
Dr. Bate
Dr. Ent
Dr. Scarburgh
Dr. Frazier
Dr. Coxe
Dr. Merret
Dr. Whistler
Dr. Clarke
Dr. [a]Cowley
Dr. Willis
Dr. Henshaw
Dr. Finch
Dr. Baynes
Mr. Christopher Wren
Mr. Smith
Mr. Ashmole
Mr. Newburg
Mr. Austen
Mr. Oldenburg
Mr. Pett
Mr. Croune.

At the next meeting, on the 5th of December, 1660, Sir Robert Moray brought word from the court, that the king had been acquainted with the deſign of the meeting, and well approved of it, and would be ready to give an encouragement to it.

The following orders were then made, that Mr. Wren be deſired to prepare againſt the next meeting for the pendulum experiment:

That Mr. Croune be deſired to look out for ſome diſcrete perſon, ſkilled in ſhort-hand writing, to be an amanuenſis: And

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[a] He had been created doctor of phyſic at Oxford, 2d December, 1657. Wood, Faſti Oxon. vol. ii. col. 120.

That it be referred to the lord viſcount Brouncker, Mr. Boyle, Sir Robert Moray, Dr. Petty, and Mr. Wren, to prepare ſome queſtions, in order to the tryal of the quickſilver experiment upon Teneriffe.

It was likewiſe agreed, that the number of members ſhould not be increaſed, but by conſent of the ſociety, who had this day ſubſcribed their names, till the orders for the conſtitution ſhould be ſettled.

The form of ſubſcribing was in the following words:

“ We, whoſe names are underwritten, do conſent and agree, that we will meet
“ together weekly, (if not hindered by neceſſary occaſions) to conſult and debate
“ concerning the promoting of experimental learning: and that each of us will
“ allow one ſhilling weekly towards the defraying of occaſional charges: provided,
“ that if any one, or more, of us ſhall think fit at any time to withdraw, he, or they,
“ ſhall, after notice thereof given to the company at a meeting, be freed from this
“ obligation for the future.”

It was farther agreed, that any three or more of the company, whoſe occaſions would permit them, ſhould be deſired to meet as a committee at three of the clock on the Friday following, to conſult about ſuch orders, in reference to the conſtitution of the ſociety, as they ſhould think fit to offer to the whole company; and ſo to adjourn from day to day.

The ſociety meeting again on the 12th of December, it was referred to the lord viſcount Brouncker, Sir Robert Moray, Sir Paul Neile, Mr. Matthew Wren, Dr. Goddard, and Mr. Christopher Wren, to conſult about a convenient place for the weekly meeting of the ſociety.

It was then voted, that no perſon ſhould be admitted into the ſociety, without ſcrutiny, except ſuch as were of, or above, the degree of baron:

That the ſtated number of the ſociety be fifty five:

That twenty one of the ſaid number be the *quorum* for elections:

That any perſon of, or above, the degree of baron might be admitted as ſupernumeraries, if they ſhould deſire it, and would conform themſelves to ſuch orders, as were or ſhould be eſtabliſhed:

And it having been ſuggeſted at the committee appointed at the preceding meeting, that the college of phyſicians would afford convenient accommodation for the aſſemblies of the ſociety, upon ſuppoſition, that it were granted and accepted of, it was thought reaſonable, that any of the fellows of the ſaid college, if they ſhould deſire it, be admitted likewiſe as ſupernumeraries, upon condition of ſubmitting to the laws of the ſociety, both as to the payment on their admiſſion and the weekly allowance, and the particular works or taſks, that ſhou'd be allotted to them.

It was alſo agreed, that the public profeſſors of mathematics, phyſic, and natural philoſophy of both univerſities, ſhould have the ſame privilege with the college of phyſicians, on the ſame condition of paying the admiſſion fee, and contributing their weekly allowance and aſſiſtance, when their occaſions permit them to be in London.

The following regulations were likewiſe reſolved upon:

That the quorum of the ſociety be nine for all matters, except the buſineſs of election.

Concerning the manner of elections:

That no perſon be elected the ſame day, on which he is propoſed.

That at leaſt twenty one members be preſent at each election.

That the amanuenſis provide ſeveral little ſcrolls of paper of an equal length and breadth, in number double to the members preſent. One half of theſe to be marked with a croſs, and the other with cyphers; and both being rolled up, to be laid in two diſtinct heaps. Every perſon then coming in his order ſhall take from each heap a roll, and throw which he ſhall pleaſe privately into an urn, and the other into a box. After which, the director, and two others of the ſociety, having openly numbered the croſſed rolls in the urn, ſhall accordingly pronounce the election.

That if two thirds of the members preſent do conſent upon any ſcrutiny, that election be good, and not otherwiſe.

Concerning the officers and ſervants of the ſociety:

That the ſtanding officers of the ſociety be three, a preſident or director, a treaſurer, and a regiſter:

That the preſident be choſen monthly.

That the treaſurer continue one year; as alſo the regiſter.

That there be likewiſe two ſervants belonging to the ſociety, an amanuenſis, and an operator.

That the treaſurer give in every quarter an account of the ſtock in his hand, and all diſburſements made, to the preſident or director, and any three others to be appointed by the ſociety; who are to report this account to the ſociety.

That any bill of charges brought in by the amanuenſis and operator, and ſubſcribed by the preſident and regiſter, for any experiment made, and ſubſcribed by the curators of that experiment, or the major part of them, be a ſufficient warrant to the treaſurer for the payment of that ſum.

That the regiſter provide three books, one for the ſtatutes of the ſociety and names of its members; another for experiments, and the reſult of debates; and a third for occaſional orders.

That the ſalary of the amanuenſis be forty ſhillings a year, and his pay for particular buſineſs at the ordinary rate, either by the ſheet, or otherwiſe, as the preſident and regiſter ſhould beſt agree with him.

That the ſalary of the operator be four pounds a year; and for any other ſervice, as the curators, who employ him, ſhall judge reaſonable.

That at every meeting, three or more of the ſociety be deſired to be reporters for that meeting, to ſit at the table with the regiſter, and take notes of every thing of importance, that ſhall be offered to the ſociety, and debated in it; and that they together form a report againſt the next meeting, to be filed by the regiſter.

That when the admiſſion money ſhall amount to twenty pounds, a ſtop be made at that ſum.

At this meeting Sir KENELME DIGBY, JOHN AUSTEN, eſq; and Dr. GEORGE BATE were choſen by vote into the ſociety.

On the 19th of *December*, WILLIAM BRERETON, eſq; and Sir WILLIAM PERSAL were propoſed as candidates to be put to the ſcrutiny at the next meeting.

The reſolutions of this day were:

That the next meeting ſhould be at Greſham College, and the future ones continued there weekly, till a farther reſolution ſhould be taken.

That Dr. PETTY and Mr. WREN be deſired to conſider the philoſophy of ſhipping, and to bring in their thoughts about it to the ſociety.

That every member be likewiſe requeſted to bring in to a committee, to be appointed for that purpoſe, ſuch experiments, as he ſhould think fit for the advancement of the general deſign of the ſociety.

That Dr. WILKINS, and as many of the profeſſors of Greſham College, as were members of the ſociety, or any three of them, be a committee for the receiving of all ſuch experiments.

And that Mr. WREN bring in his account of the pendulum experiment, with his explanation upon it, to be regiſtered.

December 26, Dr. **Goddard** was added to Dr. **Petty** and Mr. **Wren** for the experiments about ſhipping; and Sir **Kenelme Digby** was deſired to afford them his aſſiſtance: and they were requeſted to communicate to the ſociety ſome experiment at their next meeting.

Mr. **Boyle**, Mr. **Henry Oldenburg**, Mr. **John Denham**, Mr. **Rawlins**, Mr. **Elias Ashmole**, Mr. **John Evelyn**, and **Nathaniel Henshaw, M. D.** were propoſed as candidates for election.

166$\frac{0}{1}$, *January* 2, the lord viſcount **Brouncker** was deſired to proſecute the experiment of the recoiling of guns, and to bring it in at the next meeting.

Mr. **Boyle** was likewiſe requeſted to bring in his cylinder, and to ſhew at his beſt convenience his experiment of the air; as Dr. **Merret** was to bring in the hiſtory of refining; Dr. **Goddard** his experiments of colors; and Dr. **Petty** the diagrams of what he had diſcourſed to the ſociety that day, and the hiſtory of building of ſhips.

The candidates, propoſed at this meeting, to be put to the ſcrutiny at the next, were **Edmund Waller**, eſq; Dr. **Charles Scarburgh**, **Peter Pett**, **William Coventry**, —— **Rawlinson**, and **Daniel Colwall**, eſqrs.

On this day were entered into the regiſter-book[r] of the ſociety the following queſtions, propounded by the lord viſcount **Brouncker** and Mr. **Boyle**, according to an order of the ſociety of the 5th of December, and agreed upon to be ſent to Teneriffe.

1. " Try the quickſilver experiment at the top, and at ſeveral other aſcents of the
" mountain; and at the end of the experiment upon the top of the hill, lift out the
" tube from the reſtagnant quickſilver ſomewhat haſtily, and obſerve, if the remain-
" ing mercury be impelled with the uſual force or not. And take by inſtrument, with
" what exactneſs may be, the true altitude of every place, where the experiment
" is made; and obſerve, at the ſame time, the temperature of the air, as to heat
" and cold, by a weather-glaſs; and as to moiſture and dryneſs, with an hydroſcope;
" and note what ſenſe the experimenters have of the air at thoſe times reſpectively.

2. " Carry up bladders, ſome very little blown, ſome more, and others full
" blown; and obſerve, how they alter upon the ſeveral aſcents.

3. " Take up a ſtatera, two balls of like ſubſtance, differing in weight or bigneſs,
" and an open empty bottle, to the higheſt part of the hill, and there ſtop the
" bottle exactly well; and then weigh that and the balls (each ſeverally) with the
" ſtatera there, and at the ſeveral aſcents, and alſo below; and likewiſe the bottle
" again, filled with the air below, and ſtopped as before, noting the different
" weight of the ſtopper, if not exactly the ſame.

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[r] Vol. i. p. 1.

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4. " Try by an hour-glaſs, whether a pendulum clock goes faſter or ſlower on the top of the hill than below.

5. " Try the force of a ſtone-bow, or other ſpring, both above and below, and note well the difference.

6. " Make the experiment of two flat poliſhed marbles upon one another with a weight hanging at the lower, and carefully note the greateſt weight, that may be applied on the top of the hill, and alſo below.

7. " Try whether birds, that fly heavily, or others clogged with as much weight as they can well fly with below, can fly as well, better, or worſe above.

8. " Obſerve what alterations are to be found in living creatures carried thither, both before and after feeding: and what the experimenters do find in themſelves as to difficulty of breathing, faintneſs of ſpirit, inclination to vomit, giddineſs, *&c.*

9. " Try to light a candle with a match, and fire ſome ſpirits of wine; and obſerve, if they burn upon the top of the hill as well as below; and of what figures, colours, *&c.* the flames are.

10. " Fire powder in a fuſee, or otherwiſe; obſerve the manner of firing, the force of the powder, the motion of the ſmoke, and the duration of it: the like of other combuſtible things, as to flame, ſmoke, *&c.*

11. " Carry up a vial of aqua fortis, or other ſmoky liquor, and there open it, and obſerve, whether the fumes aſcend as much as they do below. Quench lime at the top of the hill, and obſerve the degree of heat, and duration of it, in reſpect to the like quenched below.

12. " Obſerve, whether any vapours faſten in little drops to the outſide of a veſſel filled with ſnow and ſalt, and try the experiment of freezing with it.

13. " Carry to the top two or three bright pieces of iron or copper, and obſerve there, whether the air doth cauſe any beginning of ruſt in them.

14. " Take ſome of the ſnow, that lies the higheſt upon the mountain, up to the top (if it may be) and obſerve what alteration is made upon it by the air.

15. " Try whether a filtre or ſiphon will bring over liquors as well on the top of the hill as below.

16. " Obſerve the difference of ſounds made by a bell, watch, gun, *&c.* on the top of the hill, in reſpect to the ſame below.

17. “ Obſerve diligently by a quadrant or double horizontal, what variation the
“ ſame needle hath both above and below.

18. “ Look upon the ſtars (or the letters of a book at ſome certain diſtance)
“ with a perſpective, as well above as below, the air being clear; and obſerve ac-
“ curately the beſt diſtance of the glaſſes in each place.

19. “ Try if any difference may be found above in things to be ſmelt or taſted,
“ from what they had below.

20. “ Make an exact narrative of every thing obſervable upon it; as where it
“ is earthy, ſandy, gravelly, rocky, *&c.* What caves, precipices, windings and
“ turnings, *&c.* What living creatures, plants, *&c.* And ſend over a little of every
“ remarkable vegetable, that may be found thereon.

21. “ Repeat the experiments, if conveniently they may, at both the ſolſtices
“ and equinoxes.

22. Obſerve accurately the time of the ſun's riſing on the top of the hill and
“ below; and note the difference.”

January 9. Dr. GODDARD was deſired to bring in writing his experiments of colours, and to produce what he had done with relation to the anatomy of trees:

Mr. ROOKE to provide tubes and quickſilver for the quickſilver experiment: And

Mr. EVELYN to ſhew his catalogue of trades.

Dr. MERRET was continued for the buſineſs of refining.

The order about reports was revived.

Mr. WYLDE, DANIEL WHISTLER, M. D. and WILLIAM HOLDER, D. D. were propoſed as candidates.

January 16. The king ſent two load-ſtones by Sir ROBERT MORAY, with a meſſage, that he expected an account from the ſociety of ſome of the moſt conſiderable experiments upon them.

The trial of theſe experiments were referred to Mr. BALLE.

The lord viſcount BROUNCKER was deſired to proſecute his experiments of the recoiling of guns.

Dr. GODDARD exhibited the following paper, which was ordered to be regiſtered[a].

“ *A brief*

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[a] Regiſter-book, vol. i. p. 3.

“ *A brief experimental account of the production of ſome colours by mixture of ſeveral* “ *liquors, either having little or no colour, or being of different colours from* “ *theſe produced.*

“ A MILKY WHITE COLOUR is produced by the mixture of ſpirit of wine impreg- “ nated with any reſinous gum, as maſtic, white benzoin, *&c.* with fair water: “ for which purpoſe the moſt tranſparent and cryſtalline gums are moſt advan- “ tageous.

“ The like is alſo produced upon much beating or agitation of water and oil “ together, upon the ſame account, in all probability, though not ſo white or per- “ manent.

“ Likewiſe in preparing of emulſions, which are made by contuſion of oily “ kernels or ſeeds, as almonds, melon-ſeeds, *&c.* in diſtilled waters or other conve- “ nient liquors. The whiteneſs alſo of milk conſiſting of parts oleoſe, as the “ butter, and aquoſe, as the whey, ſeems to be upon the ſame account.

“ The like milky white is alſo produced in the precipitation of ſome metals “ diſſolved in their proper menſtrua; as in the ſolution of mercury in aqua fortis “ caſt into brine, for making white precipitate; in diſtilled vinegar impregnated “ with lead, caſt into alum-water; in the oil of antimony caſt into fair water. “ The ſolution of coral turning white upon addition of oil of tartar ſeems to have “ affinity hereto; which may be reduced to tranſparency by addition of diſtilled “ vinegar in a competent quantity, which is the firſt diſſolvent. Tranſparent ſolid “ bodies powdered, as glaſs, ſugar-candy, *&c.* ſeem to change white upon the ſame “ account.

“ BLUE is produced by mixture of the tincture of galls in a ſmall proportion “ with lime-water; whereof the former is of a brown or high colour like ſtrong “ drink, and the latter clear as rock water.

“ YELLOW is produced in the precipitation of a ſolution of mercury in aqua “ fortis with oil of tartar; as white was mentioned before to be in the precipita- “ tion of the ſame in brine.

“ Alſo in the preparation of turbith mineral, the maſs of mercury diſſolved in “ oil of vitriol, and exhaled to dryneſs, being of a grey or aſhcolour, upon the firſt “ touch of lime-water for dulcoration, turns to a beautiful yellow, which it retains “ ever after.

“ GREEN is produced by the mixture of the ſolution of Hungarian vitriol, which “ is of a beautiful blue colour, and lime-water (which hath no more colour than “ fair water) added to it.

“ A FRESH CRIMSON RED may be induced upon a tincture of red roſes, that hath “ utterly loſt its proper colour, and is become only brown or high coloured like "ſtrong drink, by addition of a little oil or ſpirit of vitriol, ſalt, or aqua fortis. "By addition of a little oil of tartar or ſpirit of harts-horn to this tincture, ſo "heightened with oil of vitriol, it turneth green. Oil of vitriol being again "dropped in, reduceth the red colour, though with ſome diſadvantage as to the "beauty, evenneſs, and tranſparency. In preparing an infuſion of clove gilly-"flowers in ſimple water, ſome of the liquor being taken out before it had to ſenſe "gotten any of the tincture, but was like other water, upon dropping in a little "oil of vitriol, it ſhewed a perfect pink or carnation red.

"BLACK is produced by the tincture of galls and ſolution of vitriol mixed to-"gether; both which are tranſparent, and neither neceſſarily of any intenſe colour; "as in the making of ordinary ink, which conſiſts of no other conſiderable ingre-"dient except gum, to prevent too much ſinking into paper, and to give it ſome "gloſs. Hence, if one write with either of theſe liquors, upon which the letters "appear little or nothing, and wet the writing with the other, it appears plain "and legible. Oil of vitriol, ſalt, or aqua fortis mixed, diſcharges this blackneſs, "and renders the liquor tranſparent. Whence alſo theſe liquors take out blots or "writing on paper. Oil of tartar ſuperadded renders the liquor opake, and re-"duceth the blackneſs, though with diſadvantage of intenſeneſs and evenneſs."

The catalogue of trades brought in by Mr. EVELYN, and that of Dr. PETTY, were referred to them and Dr. MERRET, to be compared, methodiſed, and returned to the ſociety.

Dr. HOLDER, Dr. SCARBURGH, Mr. WALLER, Mr. COVENTRY, Mr. WYLDE, Mr. PETT, and Mr. COLWALL, were put to the ſcrutiny, and elected.

Dr. MERRET was requeſted to bring in writing that account of refining, which he had delivered in diſcourſe this day.

The lord viſcount BROUNCKER, Mr. BOYLE, Sir ROBERT MORAY, Sir PAUL NEILE, Mr. ROOKE, Mr. WREN, Mr. BALLE, Dr. CLARKE, and Mr. HILL, were appointed a committee to draw up an account of the quickſilver experiment.

Mr. EVELYN was deſired to bring in an hiſtory of engraving and etching: And

Dr. PETTY to communicate the hiſtory of ſome trade at his own choice.

Dr. GODDARD was continued for the anatomy of wood.

It was ordered, that the members of the ſociety belonging to Greſham College, together with Sir ROBERT MORAY, and as many others as thought proper, be a committe for magnetical experiments.

January 23, the lord viſcount BROUNCKER was deſired to continue his experiments of recoiling.

Mr. **Evelyn** to communicate his obſervations of the anatomy of trees:

Sir **Kenelme Digby** to bring in writing his diſcourſe made this day concerning the vegetation of plants.

Dr. **Petty** to deliver in his thoughts concerning the trade of clothing at the next meeting.

Mr. **Slingesby** to communicate his remarks upon the buſineſs of the mint: And

Mr. **Wilde** to ſhew the experiment of the ſtone kindled by wetting.

Col. **Tuke**, **William Hammond**, eſq; Dr. **Quatremaine**, Dr. **Twisden**, Dr. **Walter Charleton**, and Sir **Nicholas Stewart**, were propoſed as candidates.

It was reſolved, that no more be propoſed, till it be known, whether any of thoſe, who were firſt named, and not in the liſt, were deſirous of being admitted into the ſociety or not; and that their particular acquaintance be requeſted to learn their minds in that reſpect.

January 30, being the day of faſt and humiliation for the death of king **Charles** I. there was no meeting of the ſociety. But on the 29th of that month Mr. **Evelyn** wrote the following letter to Dr. **Wilkins** concerning the anatomy of trees[1], which ſubject had been referred to him at the preceding meeting.

“ SIR,

“ Though I ſuppoſe it might be a miſtake, that there was a meeting appointed (being a day of public ſolemnity in the church) yet becauſe I am uncertain, and that I would not diſobey your commands, I here ſend you thoſe trivial obſervations of mine concerning the anatomy of trees, and their vegetative motion.

“ It is certain, as Dr. **Goddard** has excellently ſhewn, that a ſection of any tree made parallel to the horizon will by the cloſeneſs of the circles point towards the north; and ſo conſequently, if a perpendicular be drawn through them for the meridian, the reſt of the cardinals be found out. But this is yet not ſo conſtant and univerſal, but that where ſtrong reflections are induſtriouſly made, as from walls, the warm fumes of dung-hills, ſtores, *&c.* eſpecially if the ſouthern aſpect of the ſun be intercepted, *&c.* theſe elliptical and hyperbolical circles may ſometimes become very irregular, or ſo, as I doubt not but by ſome art they might be made to have them as orderly as thoſe, which we find in Braſil and ebony, which are almoſt concentric by reaſon of the uniform motion of the ſun about them in the country, where theſe trees grow. This doubtleſs is the cauſe of the greater dilatation on the ſouth part only with us, where the parts are leſs conſtipated and more open. The conſideration whereof (though no where, that I know of, for that reaſon mentioned) made the poet[*], giving advice concerning tranſplanting, to direct, as of old they did,

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[1] Letter-book, vol. i. p. 46.

“ *Quin etiam cæli regionem in cortice ſignant:*
“ *Ut, quo quæque modo ſteterit, qua parte calores*
“ *Auſtrinos tulerit, quæ terga obverterit axi,*
“ *Reſtituant: adeo in teneris conſueſcere multum eſt.*

“ Which though Pliny neglect as a curioſity unneceſſary, I can by much experience confirm to be moſt uſeful; and that not one tree of a thouſand would miſcarry (the ſeaſon and mould well qualified) were this rule more conſtantly obſerved, having in ſome made trial of it even at midſummer. But what I would add (for all this is little to what was ſaid) is touching the cauſe of the grain of woods, which, in brief, I take to be from the deſcent rather than aſcent of moiſture. For what elſe becomes of that water, which we ſo frequently find in the cavities lodged, where many branches ſpread themſelves, and ſhoot out at the tops of great trees, eſpecially pollards, unleſs (according to its natural appetite) it ſink into the very belly of the ſtem? *e. g.* You ſhall obſerve in the walnut tree, when it is very old, that the wood of it is rarely figured, waved, and marbled as it were; for which reaſon it is much more eſteemed by joiners, *&c.* than the young, which is white, and without any conſiderable grain. The cauſe of theſe I conceive to be the diſtilling of the rain along the branches, where many of them emerge in cluſters together, both in the head and ſides of the ſtem: for there it reſts, ſinks in, and following the tenor of the pores, is the cauſe of theſe marks. Now that this wood is exceedingly replete of pores, do but plane off a thin chip from one of theſe old walnut trees, and hold it between the eye and the light, and it will ſoon convince you, that there is a paſſage ſufficient for the water, which I pretend to ſink into them. But above all, conſpicuous for theſe works and damaſkings is the maple, a finer ſort whereof the Germans call *Aire*, and therefore much eſteemed by our inſtrument makers. It is notorious, that this tree is full of branches, which dart from the ſtem, from the root to the very ſummit, by reaſon that it ſpends itſelf not much in fruit. Theſe branches then being often cut, the head becomes the more ſurcharged and furniſhed with them; which ſpreading like ſo many rays from a center form that cavity at the top of a ſtem, whence they ſhoot, which is the receptacle for the water, when at any time it rains. Now this ſinking into the pores (as before we ſhewed) is forced to divert its courſe, as it paſſes through the body of the tree, wherever it meets with the knot, that is, the roots of thoſe ſide branches which we ſaid were lopped off from the ſtem, becauſe their roots not only penetrate very deep towards the heart and pith of the tree, but are likewiſe extremely hard and impervious. It is the frequent obliquity of this courſe of the ſinking waters, cauſed through theſe obſtacles, which contributes to thoſe curious undulations, and works ſo remarkable in this and other woods, whoſe branches either cluſter at the top, or grow out collaterally, as maple and many other trees.

“ Sir, I know not whether I have well explained my conceptions in this haſty draught; but, ſuch as it is, I make bold to offer, becauſe it was commanded, as I

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[*] Virgil, georg l. 2.

“ ſhall likewiſe that ſmall, but (though I ſpeak it) moſt exact treatiſe concerning
“ *Chalcography**; the ſecond part whereof, containing the mechanical, and indeed
“ moſt uſeful, I had ſo far deſtined to the preſs, as that there were four plates cut
“ of ſeventeen, which were to illuſtrate and adorn it. But fortuning on Thurſ-
“ day laſt to ſtep into a ſhop of one, that ſells prints, and there caſually ſpeaking
“ of my book, the maſter of the ſhop told me, that he had already prepared ſuch
“ a treatiſe, being a tranſlation of monſieur Bosse; that it was printed, and with-
“ in few days would be publiſhed.

“ This being done by Mr. Faithorne, who is himſelf a ſkilful graver, I thought
“ might well take off your expectation of mine, which were collections out of
“ that author, with many additions, and a much leſs perplexed method. Mr.
“ Faithorne hath an earneſt deſire, that I would permit him to join my firſt
“ part (which is the hiſtorical, and greatly uſeful alſo) to his: but I do not think
“ it expedient, in reſpect the ſtyles do much differ; and haply, when they ſhall be
“ both compared, the additions, which are conſiderable, may be thought fit to be
“ regiſtered, if not the whole, as you ſhall conceive it worthy; for having not
“ peruſed his, I can yet make no judgment. In the mean time I proceed with
“ the firſt part, not becauſe I am fond of it, but becauſe I was long ſince engaged,
“ before I had the honour to ſerve this noble ſociety. And when that is finiſhed,
“ the printed paper, which I make bold to tranſmit to you in this (and which I
“ am likewiſe obliged to purſue) will, I hope, obtain your indulgence, not to expect
“ many other things from me till it be accompliſhed, but rather incite you to
“ contribute to my deſign ſuch aſſiſtance, as your worthy ſelf and the reſt of our
“ noble ſociety ſhall find it will require to render it uſeful and without reproach.
“ It is there, Sir, that I have at large diſcourſed of the generation of plants, and
“ upon that argument, which took up ſo much time at our laſt meeting: but it
“ ſhall not do ſo in this paper, which is at an end.

SIR, I am

Say's Court,
Jan. 29, 166$\frac{2}{3}$.

Your moſt obedient

and faithful ſervant,

J. EVELYN.”

February 6. A committee was appointed for conſidering of proper queſtions to be inquired of in the remoteſt parts of the world. It conſiſted of the lord viſcount Brouncker, Sir Robert Moray, Mr. Coventry, Dr. Petty, Dr. Goddard, Mr. Henshaw, Dr. Whistler, Mr. Rooke, Mr. Boyle, Mr. Wilkins, Mr. Povey, Mr. Evelyn, Dr. Clarke, Mr. Austen, Mr. Oldenburg, and Mr. Colwall. They were to meet on the Monday following at Greſham College.

It was then directed to be inquired, whether Dr. Wallis, Dr. Willis, Dr. Frazier, Dr. Bathurst, Dr. Finch, Mr. Smith, Mr. Jones, Mr. Vaughan, Mr. Newburgh, and Dr. Baynes deſired to be of the ſociety.

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* It was publiſhed in 1662 in 8vo. under the title of *Sculptura; or the hiſtory and art of Chalcography*. It was reprinted at London in the preſent year 1755, in 8vo.

Dr. GODDARD ſeems this day, though there is no entrance of it in the minutes, to have communicated a paper, which was regiſtered the day following [x], intitled,

Some obſervations concerning the texture and ſimilar parts of the body of a tree, which may hold alſo in ſhrubs and other woody plants.

The lord viſcount BROUNCKER was ſtill continued for the experiment of recoiling of guns, and deſired to try that, which was offered by Sir ROBERT MORAY concerning the plug; as Mr. EVELYN was to purſue the experiment about the grain of trees; and Dr. PETTY to give directions to Mr. BARLOW for the drawing of ſuch ſchemes, as were proper for his diſcourſe about clothing.

Mr. SLINGESBY was continued on the ſubject of the mint; and the lord viſcount BROUNCKER and Mr. BOYLE for the quickſilver experiment, *&c.*

February 13. The committee for foreign inquiries was appointed to meet on the Monday following, at three in the afternoon.

The Daniſh ambaſſador viſited the ſociety, being introduced by Mr. EVELYN, and was entertained with experiments on Mr. BOYLE's air-pump, *&c.*

The experiment of the compreſſion of water, was directed to be tried by Dr. WILKINS and Dr. PETTY.

The earl of SANDWICH was admitted into the ſociety; and Dr. FRANCIS GLISSON and Dr. ABRAHAM COWLEY were now propoſed as candidates, and ordered to be put to the ſcrutiny the next day.

February 20. Mr. EVELYN was deſired to prepare oil of ſulphur for the experiment of its weight and bulk; Dr. PETTY to bring in writing the experiment of the coppels; Dr. WHISTLER, Mr. POVEY, and Mr. HILL, their ſnake-ſtones; and Dr. MERRET an appendix to his paper on the art of refining [y], about cementation and the antimony ſtone.

February 23. Experiments were made at the Tower of London, on the weight of bodies increaſed in the fire; an account of which being drawn up by the lord viſcount BROUNCKER was regiſtered [z], and afterwards printed [a].

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[x] Regiſter-book, vol. i. p. 5. It is printed in Mr. EVELYN's Sylva, b iii. ch. 3. p. 233. 4th edit. London 1706, fol.

[y] It was entered Feb. 22, $166\frac{2}{3}$, into the Regiſter-book, vol. i. p. 8. and is printed in the Philoſophical Tranſactions, vol. xi. n° 142. p. 1046.

[z] Regiſter-book, vol. i. p. 14.

[a] Dr. SPRAT's hiſtory of the Royal Society, p. 228.

February 25. It was reſolved, that the amanuenſis attend every meeting-day, and ſet down ſuch things as the ſociety ſhall think proper; and that his annual ſalary be increaſed from two to four pounds:

That the members, who have been employed to make extracts out of ſeveral authors for the drawing up inquiries in foreign parts, be a committee for collecting ſuch particulars as are moſt fit for that purpoſe:

That it be referred to Mr. Rooke and Mr. Crowne to conſider the particulars of the meetings of the ſociety till that time:

That the eſſay of the coppels made at the Tower be regiſtered:

That an eſſay-furnace be built, and an accurate beam be provided for the uſe of the ſociety.

Sir Robert Moray was deſired to communicate in writing an account of the bernacles.

Sir Henry Blount, bart. and Dr. Wallis, were propoſed as candidates.

March 4. The king ſent by Sir Paul Neile five little glaſs bubbles, two with liquor in them, and the other three ſolid, in order to have the judgment of the ſociety concerning them.

Sir William Persall communicated the following experiment:

" Take an handful of the powder of roman vitriol; put it into a gally-pot in a
" pint of water: put in two or three ſmall irons the length of a ſpan, and three or
" four times a day conſtantly ſtir the water and powder, and move not the irons at
" all, but let them ſtand conſtantly in, night and day; and within the ſpace of three
" weeks there will be cruſted about the irons, as far as they are in the water, a ſub-
" ſtance purer than copper, which you may take off, and it will be malleable."

March 6. Sir Robert Moray was choſen preſident.

Sir Henry Blount, bart. Col. Samuel Tuke, Dr. Wallis, Dr. Glisson, and Dr. Cowley[b] were elected into the ſociety.

The amanuenſis having provided the glaſs-bubbles, which he had been ordered to prepare, they ſucceeded in the ſame manner with thoſe ſent by the king.

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[b] He publiſhed about this time his *Propoſition for the advancement of experimental philoſophy. Dedicated to the honourable ſociety of Greſham College.* Printed at London 1661, in 8vo. See Dr. Worthington's epiſtles to Mr. Hartlib among his Miſcellanies, p. 243, and biſhop Kennet's Regiſter and chronicle, p. 870. Dr. Sprat, hiſt. of R. S. p. 59. obſerves, that this treatiſe very much haſtened the *contrivance* of the *platform* of the royal ſociety. The intent of the *propoſition* of Mr. Cowley was, that in ſome place near London there ſhould be liberal ſalaries beſtowed on a competent number of learned men, to whom ſhould be committed the operations of natural experiments.

Some of theſe made for the ſociety were ordered to be carried to the king by Sir PAUL NEILE; and that gentleman, the lord viſcount BROUNKER, Mr. SLINGESBY, and Mr. BRUCE, were appointed a committee to go to the glaſs-houſe at Woolwich, in order to inquire into the experiment of thoſe ſolid bubbles ſent by his majeſty.

Sir ROBERT MORAY having given in, probably this day, his relation concerning the bernacles, it was regiſtered[c] on the 8th of *March*.

March 11. Sir WILLIAM PERSALL was deſired to bring in an account in writing of his obſervations on the load-ſtone.

Mr. JOHN VAUGHAN was propoſed as a candidate.

March 13. It was reſolved, that it ſhould be free for any member of the ſociety to have copies of any paper regiſtered, but not to communicate them to ſtrangers without leave of the ſociety, except it were his own paper.

Dr. THEODORE DE VAUX ſhewed ſome curious ſtones to the ſociety, and was propoſed as a candidate.

Mr. EVELYN produced *an exact relation of the Pico of Teneriffe, taken from Mr.* CLAPPHAM; which was regiſtered[d] on the 29th of June 1661, and publiſhed afterwards by Dr. SPRAT[e], but with ſome difference in the form of it, and the omiſſion of ſeveral things. It appears from the original, that the journey to the *Pico* from Oratava was performed about the 20th of Auguſt 1646, by Mr. CLAPPHAM, together with Mr. PHILIP WARD, Mr. JOHN WEBBER, Mr JOHN COWLING, Mr. THOMAS BRIDGE, and Mr. GEORGE COVE, *all of them conſiderable merchants and worthy of credit*; and that the *judicious and inquiſitive* man, who had lived twenty years in the iſland of Teneriffe, was Dr. PUGH, *a perſon of very great reputation* in London at the time of the communication of this account by Mr. EVELYN.

Sir ROBERT MORAY read the ſame day a relation of the *making of ceruſs*, from from Mr. VERNATTI[f]; upon which a committee conſiſting of Dr. GODDARD, Dr. PETTY, Dr. MERRET, Dr. WHISTLER, the lord viſcount BROUNCKER, and Mr. AUSTEN, were appointed to examine the method of making of ceruſs.

March 18. A diſcourſe being held concerning the water's aſcending in tubes or ſyphons, Dr. HENSHAW made ſeveral experiments in one tube with water, ſpirit of wine, roſe-water, ſpirit of ſalt, and ſpirit of vitriol.

Sir PAUL NEILE brought in ſome ſolid glaſs balls.

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[c] Regiſter-book, vol. i. p. 15. It is printed in the Philoſophical Tranſactions, vol. xi. n° 137. p. 925. for Jan. and Feb. 167$\frac{5}{6}$.

[d] Regiſter-book, vol. i. p. 36.

[e] Hiſt. of the Royal Society, p. 200.

[f] Regiſter book, vol. i. p. 19. It is printed in the Philoſophical Tranſactions, vol. xi. n° 137. p. 935.

The experiment of the king's bubbles was deferred till Mr. Lewin could ſet a pot of metal in a hotter fire than that in the Minories.

Mr. Boyle was requeſted to remember his experiment of the air.

March 20. It was reſolved, that the number of the members of the ſociety be enlarged:

And that the profeſſors of Greſham College, who were members, be overſeers for fitting up the room for the ſociety's meeting there.

The amanuenſis was ordered to make the experiment of the calcination of antimony, whether it increaſeth or not; and to weigh it before and after, in and out of the water.

Dr. William Quatremaine, and Mr. John Vaughan, were elected members; and Dr. Walter Charlton ordered to be the firſt put to the ſcrutiny at the next meeting; who however was not admitted of the ſociety till the 15th of May following.

Dr. Petty was deſired to communicate his relation of clothing, before he went to Ireland.

March 25. Dr. Henshaw was deſired to inquire of his brother concerning the boat, which would not ſink.

It was directed likewiſe, that inquiry ſhould be made, whether there be ſuch little dwarfiſh men in the vaults of the Canaries, as was reported; and concerning the paper relating to the Canaries.

Mr. Boyle was requeſted to report the name of the place in Braſil, where that wood is, which attracts fiſhes; and of the fiſh, which turns to the wind, when ſuſpended by a thread.

Dr. Merret was to be aſked for the catalogue of trades, which he took, of Mr. Evelyn's and Dr. Petty's.

March 27. It was ordered to inquire, whether the flakes of ſnow are bigger or leſs in Teneriffe than in England: and whether the groſs fume of oil of tartar mixed with aqua fortis will aſcend as much, more or leſs, above than below the mountain Teneriffe.

Adders were directed to be provided to try the experiment of the ſtone.

Dr. Goddard propoſed a method of meaſuring the compreſſion of the air.

Mr. Boyle was deſired to haſten his intended alteration of his air-pump.

The amanuenſis was ordered to calcine antimony, according to the deſcription in Monſieur LA FEBURE's book.

April 1. It was ordered, that care be taken for the calcination of antimony at the height of the ſun:

That the amanuenſis provide a crooked tube for trying the experiment of water piercing quickſilver, or repelling it by its weight:

That two engines be made, one like the glaſs one, and the other agreeable to the form of that of Mr. ROOKE; and if the ſtock of the ſociety would not furniſh the expence, the members ſhould contribute to the defraying it; and the committee appointed for the care of this buſineſs were Mr. BOYLE, Dr. GODDARD, and Mr. ROOKE.

CORNELIUS VERMUYDEN, eſq; was propoſed as a candidate.

April 3. Mr. BOYLE, Dr. MERRET, and Mr. COLWALL, were deſired to draw up an account of the manner of making vitriol; and Dr. PETTY to inquire in Ireland concerning the petrification of wood, the bernacles, the variation of the compaſs, the trial of the quickſilver experiment, and the ebbing and flowing of a brook.

Mr. BOYLE was requeſted to conſider, at his leiſure, of GLAUBER's method of diſcovering minerals.

He delivered to the ſociety his book concerning glaſs-tubes; upon which it was ordered, that every member ſhould have one of theſe books, in order to diſcourſe upon it at the meeting on that day ſe'nnight.

It was reſolved, that at the next meeting it ſhould be conſidered, whether the matters to be debated at any meeting ſhould be agreed upon at the preceding one.

An inquiry was again ordered to be made, concerning the fiſh mentioned by SCHOTTUS, as turning to the wind, when ſuſpended by a thread.

April 7. The lord viſcount BROUNCKER made his experiments of the recoiling of guns; which ſucceeded according to expectation.

The ſociety did not ſit this day:

April 10. The lord viſcount BROUNCKER was deſired to give in writing an account of his experiments of the recoiling of guns.

His lordſhip was likewiſe appointed of a committee with Sir ROBERT MORAY, Sir PAUL NEILE, Dr. WALLIS Dr. GODDARD, and Mr. WREN, to conſider all ſorts of tools and inſtruments for making glaſſes proper for perſpectives, for the uſe of the ſociety; and to meet together on Fridays for that purpoſe.

Sir Robert Moray was choſen preſident for another month.

The following reſolutions were agreed to:

That the amanuenſis inform himſelf of the habitation of every particular member, in order to ſummon them to the meetings of the ſociety, whenever matters of importance were to be debated:

That the ſociety meet no more than once a week; and that the meeting be on Wedneſday:

That the ſociety be adjourned till that day three weeks:

That every member pay his contribution and arrears every Wedneſday:

That the ſubject of the debate of every ſubſequent meeting be agreed upon at the preceding:

That the ſubject of the next debate be Mr. Robert Hooke's tract, printed in 1660, concerning the cauſe of the riſing of water in ſlender glaſs-pipes higher than in larger, and that in a certain proportion to their bores [g].

The amanuenſis was ordered to make ſeveral crooked glaſſes with bubbles at the end.

May 1. It was ordered, that the treaſurer, or his deputy, be deſired to call every day on the members for their arrears:

That the amanuenſis provide an engine for diving as ſoon as poſſible, and a cylindrical glaſs, with water and ſmall empty bubbles in it; and that he draw up a liſt of all the orders not yet executed:

That the ſubject debated this day, purſuant to the order of the laſt meeting, be reſumed at the next.

May 8. It was propoſed, that the ſociety write to Mr. Wren, and charge him, in the king's name, to make a globe of the moon [h]; and likewiſe to continue the deſcription of ſeveral inſects, as he had begun.

Mr.

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[g] See Mr. Waller's Life of Dr. Hooke, p. viii.

[h] The king's command to Mr. Wren to proſecute and perfect this lunar globe was ſignified to him by a letter under the joint hands of Sir Robert Moray and Sir Paul Neile, dated from Whitehall, the 17th of May, 1661. This globe repreſented not only the ſpots and various degrees of whiteneſs upon the ſurface of the moon, but the hills, eminences, and cavities of it moulded in ſolid work. On the pedeſtal was engraved this inſcription, and underneath a ſcale of miles:

CAROLO SECVNDO
M. BR. FR. ET HIB. R.
CVIVS AMPLITVDINI QVIA VNVS NON SVFFICI
NOVVM HVNC ORBEM SELENOSPHAERIO
EXPRESSVM
D. D. D.
CHR. WREN.

4

His

Mr. Rooke was deſired to give in writing his obſervations of the iſland of St. Helena.

A letter having been read from prince Leopold, brother of the grand duke of Tuſcany, to the ſociety, a committee, conſiſting of the lord viſcount Brouncker, Mr. Boyle, Sir Kenelme Digby, Sir Robert Moray, Dr. Ent, the preſident for the time being, and Mr. Croune, was appointed to correſpond conſtantly with that prince; three of them at leaſt to be *a quorum*; to meet on the Monday following at the lord viſcount Brouncker's lodgings, and to draw up an anſwer as ſoon as poſſible to the prince's letter.

Mr. Colwall read an account of the making of green copperas, and produced a baſket of the copperas ſtones.

After reading this account, Sir Robert Moray was deſired to write to the jeſuits of Liege, about their manner of making copperas there.

It was ordered, that Mr. Colwall's account be regiſtered[b]; and that the ſociety have copies of it, in order to form queſtions upon it.

It was obſerved upon this occaſion, that Chemnitz in Hungary produced the beſt vitriol.

Dr. Wilkins having moved as a ſubject worthy of conſideration the generation of ſeveral inſects,

Sir Robert Moray was deſired to uſe his beſt endeavours to procure the hiſtory of inſects;

Dr. Clarke to bring under Mr. Pellin's hand the relation of the production of young vipers from the powder of the liver and lungs of vipers; as Sir Kenelme Digby promiſed one under the hand of a nobleman;

Dr. Clarke and Mr. Boyle, to procure an hiſtory of vipers.

Dr. Goddard to ſuſpend over a warm balneum a glaſs nipt up with ſalt of tartar in it.

Mr. Boyle, Dr. Goddard, and Dr. Petty, to conſult concerning the nature of gravity.

Mr. Croune to write to Dr. Power, and to procure a correſpondency between Sir William Persall, Mr. Balle, and Dr. Power, who was propoſed as a candidate, as was likewiſe Mr. John Aleyn.

His majeſty received this globe with pecular ſatiſfaction, and ordered it to be placed among the curioſities of his cabinet. This globe came afterwards into the poſſeſſion of Mr. Wren's ſon, Christopher Wren, eſq. Dr. Ward's Lives of the profeſſors of Greſham College, p. 100. n. (a).

[b] Regiſter-book, vol. i. p. 21. It is printed in the Philoſ. Tranſ. vol. xi. nº 142. p. 1056.

Mr. Boyle and Mr. Evelyn were appointed curators for the obſerving of inſects.

A motion was made for the erecting of a library for the uſe of the ſociety.

May 15. Sir Robert Moray having had occaſion to acquaint the king with prince Leopold's letter to the ſociety, had his majeſty's conſent to return an anſwer to it.

It was reſolved, that Sir Paul Neile be deſired to continue his employment of the artificer for making glaſſes for perſpectives:

And that Dr. Goddard do undertake the trying the weight of bodies in water and air.

A book having been preſented to the ſociety by Col. Tuke from an academy at Paris[a], the committee for foreign correſpondence was directed to return a ſpeedy anſwer to that academy, with the thanks of the ſociety; and Col. Tuke was added to that committee.

Mr. Boyle preſented the ſociety with his engine.

Dr. Baynes, Dr. Finch, the lord viſcount Brouncker, Mr. Boyle, Dr. Wilkins, Dr. Ward, Dr. Wallis, Dr. Merret, Mr. Oldenburg, Mr. Evelyn, Mr. Waller, and Mr. Henshaw, were nominated a committee for erecting a library, and examining the generation of inſects.

Dr. Charlton and Mr. Aleyn were admitted into the ſociety; and Sir Gilbert Talbot and Mr. Walter Pope, who had been lately choſen profeſſor of aſtronomy in Greſham College, on the reſignation of Mr. Wren, were propoſed as candidates.

Robert earl of Sunderland, and Col. Tuke, ſubſcribed their names as members.

It was reſolved, to ſtate the number of the ſociety at the next meeting:

That from henceforth every member, as ſoon as he ſhall be admitted, ſhall pay, beſides twenty ſhillings advancement, his weekly contribution from the time of his admiſſion.

The ſubjects of the debate of the next meeting were appointed to be concerning the little tubes, and the Florentine experiment.

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[a] This academy began their meeting on the 18th of December 1657, at the houſe of Monſieur de Montmor, according to the account of Monſieur Graverol in his *Memoires pour la vie de Monſieur de Sorbiere*, prefixed to the *Sorbierana*. Monſieur de Sorbiere himſelf in a letter to Mr. Hobbes, dated at Paris, Feb. 1, 1658, and printed in his *Lettres & diſcours ſur diverſes matieres curieuſes*, p. 631. edit. Paris 1660. mentions the regulations of that aſſembly; and ſome of his diſcourſes read there in the years 1658 and 1659, are publiſhed in that work, p. 181, 190, 193, 694, and 701.

May 22. Col. Tuke was deſired to bring in writing a ſhort account of what he had related to the ſociety concerning the academy at Paris; and a return of thanks was ordered to be made to Monſieur de Montmor [l], maſter of the requeſts to the French king, and to Monſieur de Sorbiere, both members of that academy.

It was ordered, that the committee of correſpondency ſhould meet again the next day, at the lord viſcount Brouncker's chamber, or elſewhere, as they ſhould agree.

A diſcourſe was held concerning poiſon; on which occaſion it was obſerved, that one grain and a half of nux vomica will kill a large bird.

The ligature of vipers from the tail to the head was directed to be tried.

Dr. Finch and Dr. Baynes were deſired, upon their arrival in Italy [m], to inquire after poiſons; and Mr. Povey to ſend to Bantam about the examination of that poiſon, which is related to be ſo quick, as to turn a man's blood ſuddenly into jelly.

Dr. Finch was requeſted to draw up a letter to be ſent to prince Leopold.

The committee for the examination of inſects was appointed to meet on the Monday following, at ſix of the clock, at Mr. Boyle's lodgings.

The generation of inſects was diſcourſed of, and the lord Hatton was deſired to write about Mr. Morin's book of inſects, and to purchaſe it, if poſſible; and the earl of Northampton to make the like inquiry about Mr. Marshal's treatiſe on the ſame ſubject.

Dudley Palmer, eſq; was propoſed as a candidate.

It was reſolved, that Wedneſday the 26th of June be a ſolemn meeting of the ſociety; and that every member be ſummoned, to conſult about elections.

The next meeting day to be the Tueſday following.

Sir Kenelme Digby was deſired to bring in at the next meeting his papers and the ſtones mentioned by him this day.

The Florentine experiment was ordered to be continued.

Mr. Boyle was deſired to repeat his experiment at the next meeting.

The buſineſs of the hiſtory of trades was appointed to be diſcourſed of at the next meeting.

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[l] Henry Lewis Habert, Seigneur de Montmor. He died at Paris the 21ſt of January, 16,9, N. S.

[m] They had both a deſign of going again to Italy, whence they had returned upon the reſtoration; but they did not perform this ſecond journey to that country till 1665. See Dr. Ward's Lives of the profeſſors of Greſham College, p. 228, 229.

The amanuenſis was ordered to go the next day to Roſemary-lane, to beſpeak two or three hundred more of the ſolid glaſs balls.

Sir Gilbert Talbot and Mr. Pope were admitted of the ſociety.

May 28. Sir Kenelme Digby brought in and read his relation of plants and animals, and was deſired to publiſh it, and to leave the original in the ſociety's cuſtody.

It was reſolved, that every member, who hath publiſhed or ſhall publiſh any work, give the ſociety one copy.

Dr. Wilkins, Dr. Ent, Dr. Whistler, Dr. Ward, Dr. Henshaw, and Mr. Rooke were appointed a committee for matters of fact concerning the riſing of liquors in ſmall pipes.

Dr. Clarke was deſired to communicate the experiments of injections into veins.

Mr. Dudley Palmer was admitted of the ſociety.

June 5. Sir Kenelme Digby brought in the ſtones mentioned by him at the meeting of the 22d of May, and called by him *oculus mundi*.

Col. Tuke related the manner of the rain like corn near Norwich.

Mr. Boyle and Mr. Evelyn were deſired to ſow ſome of theſe rained ſeeds, and to try their product; and col. Tuke to bring in more of theſe ſeeds, and to inquire exactly into the hiſtory of them.

Dr. Charlton was requeſted to entreat the lord Hatton to inquire for Mr. Morin's book of inſects.

Mr. Boyle related, that a gentleman having made ſome experiments on the air, tried that of the quickſilver at the top and bottom of an hill, where there was found the difference of three inches.

Magnetical cures being then diſcourſed of, Sir Gilbert Talbot promiſed to communicate what he knew of ſympathetical cures; and thoſe members, who had any of the powder of ſympathy, were deſired to bring ſome of it at the next meeting.

Dr. Charlton promiſed to deliver in ſome of that white powder by the Bath, which put into water heats it.

Dr. Clarke was requeſted to give in the narrative of his injection of liquors into the veins.

He moved, that it might be tried in Mr. **Boyle's** engine, whether filtration would ſucceed in it, or not.

A diſcourſe was held concerning the extinguiſhing of a lighted candle in a veſſel like a funnel or blind-head.

The duke of **Buckingham**, who was admitted of the ſociety this day, was requeſted to order charcoal to be diſtilled by his chemiſt.

It was obſerved, that the two cats bitten by the vipers on the 15th of May, did not die, but recovered the next day.

The duke of **Buckingham** promiſed to bring to the ſociety a piece of an unicorn's horn.

Sir **Kenelme Digby** related, that the calcinated powder of toads reverberated, being applied in bags upon the ſtomach of a peſtiferate body, cures it by ſeveral applications.

Dr. **Charlton** was deſired to bring in at the next meeting, ſome poiſon for trying the experiment upon little birds.

The letter to prince **Leopold**, and that to the academy at Paris, were both referred to the committee of correſpondence.

Sir **John Pettus**, and Mr. **Richard White**, were propoſed as candidates.

Col. **Tuke** having given in (probably this day, though there is no minute of it) his relation concerning the academy at Paris, it was regiſtered on the 12th of June, and was in theſe terms[a].

"Mr. **President**,

"Being very ſenſible of the great obligation, which I lately received from this "learned aſſembly, by my admiſſion into your ſociety, I did excogitate the means, "which might beſt expreſs my juſt eſteem for your perſons, my zeal for the ad"vancement of your worthy deſigns, and my gratitude for the unmerited favour, "which you have been pleaſed to confer upon me.

"And conceiving, that there is nothing, which does more increaſe the force of "the commonwealth of letters than a correſpondency with the learned men of "other nations, and all little enough to withſtand the rude aſſaults of the igno"rant multitudes, who wanting the virtuous induſtry to improve their natural "light, do endeavour (by decrying all acquired knowledge in others) to make "their own lazy ignorance paſs for judgment: from this reflection I did preſume, "that it might be an agreeable ſervice to this illuſtrious aſſembly, to inform my-

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[a] Regiſter-book, vol. I. p. 25.

" ſelf, when I was lately in Paris, what friends we had in that flouriſhing city: " and to this end I ſought out an old acquaintance of mine, one Monſieur de " ROBERVAL, a learned and judicious gentleman, who poſſeſſes the chair of the " king's profeſſor of the mathematics in Paris, from whom I received this account:

" That there were ſeveral aſſemblies of learned men in Paris, of which the moſt " conſiderable was the French academy, formerly inſtituted by cardinal de RICHELIEU, and ſince protected by Monſieur de SEGUIER, chancellor of France, at " whoſe houſe they did uſe to meet, but were now very much declined by the barrenneſs of the ſubject of their entertainment, which was only the embelliſhing of " their ſtyle and poliſhing of verſe; but eſpecially by a new inſtitution of an aſſembly of learned men, whoſe buſineſs is to advance the knowledge of nature by " conferences and experiments; into which ſociety many, that were formerly of the " French academy, are now entered.

" Finding by Monſieur de ROBERVAL's diſcourſe, that the entertainment of this " ſociety had a near reſemblance to the deſign of thoſe, who aſſemble here, ſome " few days before I left Paris, I went along with Monſieur le COMTE D'ALBONNE, " a perſon of eminent quality, and a great lover of learning, to Monſieur de " MONTMOR's houſe, the patron and preſident of this ſociety, where they aſſemble " every Tueſday in the afternoon; who received us very civilly. And he being " informed by Monſieur le COMTE D'ALBONNE, that I had the honour to have a " place in this aſſembly, after he had ſhewed me his pictures and his medals, and " his garden of flowers, in all which he is very curious, he brought me into the " hall, where thoſe of the ſociety do aſſemble.

" There I found near twenty perſons, ſitting in a ſemicircle about a table; at " which the preſident himſelf ſat, and did me the honour to place me by him.

" As ſoon as we were ſeated, Monſieur de SORBIERE, ſecretary to the aſſembly, " addreſſing to the preſident, told him, that Monſieur QUILLET, who ſhould that " day have entertained them with a diſcourſe of comets, had ſent to let him know, " that he was indiſpoſed, and deſired their excuſe. So they fell upon the diſcourſe " of an experiment, which they had lately made. Which being ended, Monſieur " de MONTMOR, the preſident, informed the ſociety, that I had the honour to be " of your number; and deſired me, that I would report to them the ſubject of your " conferences, and the forms of your inſtitutions; which I did as well as I was able.

" After they had had the patience to hear ſo unpoliſhed a relation, the preſident, Monſieur de MONTMOR, replied, that he was overjoyed to hear of the " growth of ſo noble a deſign, of whoſe birth they had been advertiſed by letters " from Monſieur OLDENBURG. And he ſaid, they did not doubt but that the " ſucceſs would anſwer the expectations of all the lovers of learning; being convinced by many modern pieces, that had been written by our countrymen, that " the genius of our nation was very well fitted for the advancement of all ſorts of " learning. And then he mentioned GILBERT, BACON, HARVEY, HOBBES, " DIGBY, GLISSON, CHARLTON and divers others, whoſe names do not occur to

" my memory. Then he deplored the unhappy condition of the nobility and gen-" try of their nation, who not being able to furniſh the profuſion of their expences " from their patrimonies, were forced, as ſoon as they were capable of buſineſs, to " purſue their fortunes either in the court, armies, or governments in the provin-" ces, that they had not the leiſure to cultivate their minds by letters. This oc-" caſioned a groſs ignorance amongſt the perſons of quality, and conſequently a " diſregard to all ſorts of ſciences.

" I told them, that the noblemen and gentlemen of our country, having plen-" tiful revenues in land, and their expences being proportioned to their eſtates, " they had both time and means to acquire knowledge: and that we were ſo happy " as to be governed by a king, who, amongſt other illuſtrious qualities, was a great " favourer of learning: and that we promiſed ourſelves from the prudence of his " government ſo much peace and plenty, as we did not doubt to ſee the arts and " ſciences flouriſh in our country. This confirmed their belief, which was ex-" preſſed by many elogies, both of his majeſty and our nation, by divers of the " aſſembly; and they concluded with their earneſt deſires of a correſpondence with " us, as the beſt means to increaſe our common light, to render our lives more " pleaſant by our mutual commerce, and to ſtrengthen the republic of learning.

" I aſſured them, that as ſoon as I arrived, I would not fail to communicate " their deſign to our ſociety; who were not ſuch ſtrangers to the reputation of their " illuſtrious aſſembly, as not to embrace this overture of commerce with great " reſpect and ſatisfaction.

" Then Monſieur le Comte d'Albonne acquainted them with a relation, which " I made to him of Mr. Boyle's engine, and of divers experiments concerning the " extenſion of air; with which they ſeemed very much delighted, and deſired me " to ſend them Mr. Boyle's book upon this ſubject; with this promiſe, that if " they made any diſcoveries worthy of our knowledge, they would freely impart " them to us.

" The next day the preſident, Monſieur de Montmor, came to my lodging at " Palais Royal, and carried me to one Monſieur de Rohault's houſe, who is of " their ſociety, from whom I heard a very ingenious lecture of the nature of the " load-ſtone, and his hypotheſis made out by divers curious experiments.

" The day following Monſieur de Sorbiere, ſecretary to their ſociety, did me " the honour to viſit me, who told me, that he was commanded by the preſident " and the reſt of the ſociety to make me a compliment, and to remind me of my " promiſe of endeavouring to eſtabliſh a commerce between them and this ho-" nourable ſociety; and then he preſented me with that book, which I produced at " my firſt appearance in this learned circle.

" This is a ſummary account of the relation, which I lately made in this place " more at large."

June 13. Dr. Charlton gave three grains of nux vomica to a young thruſh, and as much to a young woodpecker, who had convulſions about three hours before they died. He gave alſo to another young thruſh two grains of nux vomica and as much ſublimate mixed together; and that killed the bird in nine minutes time.

Col. Tuke brought in the hiſtory of the rained ſeeds and ſome ivy-berries, the kernels of which were the ſame, that were reported to have fallen down from the ſky in Warwickſhire, Shropſhire, *&c.*

Dr. Charlton was deſired to provide two male vipers againſt the next meeting, and to communicate his relation concerning poiſon:

Mr. Wylde to ſhew the experiment of the ſtone kindled by wetting:

Dr. Henshaw to procure the like experiment, and alſo the hiſtory of mechanics:

Sir William Persall to make his vitriol experiment:

Dr. Scarburgh to bring in his relation of echos:

Mr. Rooke that of the ſatellites of Jupiter, and the height of the atmoſphere:

Dr. Wilkins the filtrations: And

Mr. Pope to procure the experiment of breaking pebbles with the hand.

It was ordered, that the experiment of the cupping-glaſs and lighted candle be made at the next meeting:

That the diving engine be prepared with the utmoſt expedition:

That the ſympathetic powder be brought in at the next meeting:

That the orders of every preceding meeting be read at the ſubſequent one.

Dr. Charlton preſented the ſociety with his book entituled, *Exercitationes pathologicæ, in quibus morborum pene omnium natura, generatio, & cauſæ, ex novis anatomicorum inventis ſedulo inquiruntur*[o].

Mr. Oldenburg brought in an account of Monſieur Morin's treatiſe on inſects.

June 14. There were entered into the Regiſter-book[p], *Propoſitions of ſome experiments to be made by the earl of* Sandwich *in his preſent voyage*[q]:

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[o] Printed at London 1661, in 4to. [p] Vol i. p. 29. [q] to Liſbon, in order to bring over the Infanta of Portugal, who was to be married to king Charles II.

1.

1. "To ſound the depth of the ſea in the bay of Biſcay and the Straits, at full "ſea, or low water, without a line, thus:

"Take a globe of ſome ſwimming wood, having a hook faſtened to it. Then "take a lead ſufficient to ſink it, ſhaped like the figure of 7; and put the upper "part of it into the hook, and as you let it fall into the ſea, take notice of the time "by a ſecond-watch, and obſerve how long the globe is ſubmerſed in the water; "for by that the depth is to be computed. So ſoon as the lower end of the lead "touches the ground, it ſlips out of the hook, and up comes the globe. The rule "of computing the depth of the water by the time of the globe's ſubmerſion, is to "be made by trying it in a depth of 60, 80, or 100 fathoms: ſo is another time "to another number of fathoms.

2. "To ſink an empty globe of tin with an addition of lead, faſtened to a line, "as many hundred fathoms deep as may be, to ſee what will become of it.

3. "In ſome place of the ſea of two or three hundred fathoms deep, or more, "draw up ſome of the water near the bottom, to compare the ſaltneſs of it with "that next the ſuperfice. It is to be done thus, or ſome other ſuch way:

"Take a cylindrical veſſel, and fit a ſucker to it, with a ſhaft or hook to hold a "ſtring or ſmall line faſtened to it. Put the ſucker or ſtopper down to the bottom "of the veſſel, which is to have a ſmall hole at the bottom. Then ſink and let "down the veſſel by a long cord into the water, together with a line as long as is "faſtened at the ſtopper; and let down ſo dextrouſly, as it pluck not up the "ſtopper, till the veſſel be at the depth propoſed; then pluck out the ſtopper, "and the veſſel will bring up the water from the depth that is deſired.

4. "To take up a glaſs full of ſalt-water on the Engliſh ſhore, and weigh it; "then evaporate the water, and ſee what ſalt it holds; and thus do often; that "is at every three or four degrees, as you go ſouthward.

5. "Inquire after a true account of the ebbing and flowing between the "Straits; and whether the tide flow always eaſtward at the ſhores, and at the "middle; and how it varies, if it be not conſtant. And if you have the oppor"tunity, try whether in the middle of the Straits the ſurface of the water flow "eaſtward, whilſt the lower part of it runs weſtward.

"This is to be done by letting a bucket down 60, 80, or 100 fathoms, and tied "to a boat; and then, if there be contrary motions in the water, the boat will "ſtay as at anchor, or move accordingly.

6. "Take ſea-water in a fit veſſel into a dark place, and ſhake and agitate it ſo "as it may break into drops, to ſee whether it will ſparkle and ſhine, as when it is "in the ſea, broken by the wind or otherwiſe in the night."

June 19. A loadſtone was produced weighing 2lb. 2oz. and an anchor of 11lb. 10oz.

Dr. CHARLTON read his paper on poiſons.

It was ordered, that two puppies be provided againſt the next meeting, for the trial of experiments of poiſons.

Mr. POVEY was deſired to deliver in an account of braſs.

Sir GILBERT TALBOT's experiments of the ſympathetic powder were ordered to be regiſtered [r].

Sir ROBERT MORAY and Mr. HAMMOND produced their ſympathetic powders.

Mr. EVELYN was deſired to bring in to the next meeting that powder of ſympathy, which he had of Sir GILBERT TALBOT's making:

And Mr. POPE to continue his experiment of breaking pebbles with the hand.

Mr. BOYLE's experiment of the flat marble was ordered to be tried at the next meeting:

And that of the poiſonous arrow, produced by Mr. VERMUYDEN, to be tried on the ſame day.

June 26. The experiment of the cupping-glaſs and light was made, and ſucceeded according to expectation.

A dog was bit in the left foot by a viper, and ſwelled for three or four hours; but recovered.

Another dog was wounded with a poiſonous arrow; but no harm appeared to ariſe from it.

Dr. ENT, Dr. CLARKE, Dr. GODDARD, and Dr. WHISTLER, were appointed curators of the propoſal made by Sir GILBERT TALBOT, of tormenting a man with the ſympathetic powder.

Dr. GODDARD, Dr. WILKINS, and Mr. ROOKE, were deſired to curators be of the experiment of compreſſing of water at the next meeting.

Mr. ROOKE was requeſted to ſpeak to Mr. PELLIN, to procure two pots of powder of vipers, the one of whole vipers, and the other of only the hearts and livers of vipers: And Mr. HENSHAW to bring in the experiment of ſalt-petre, and gun-powder.

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[r] Vol. i. p. 31.

It was ordered, that the operator ſhould make the experiment of the ſolar calcination of antimony, to ſee whether it increaſed in weight.

Mr. Boyle brought in three cylinders of glaſs ſealed up, and full of water, with empty bubbles nipt up; ſome of which aſcended, the water being heated, and others deſcended by the like heating; and others aſcended, the water being cooled in cold water, and deſcended by heating the water.

Sir John Pettus and Mr. Richard White were elected into the ſociety.

Philip Packer, eſq; Thomas Stanley, eſq; Sir Thomas Notte, knt. and William Aerskine, eſq; were propoſed as candidates.

Dr. Quatermaine ſubſcribed his name.

Col. Tuke brought in writing the following *Brief account of the ſuppoſed rain of wheat*, which was regiſtered[a].

" On the the 30th of May, 1661. Mr. Henry Puckering, ſon to Sir Henry Puckering of Warwick, brought ſome papers of ſeeds, reſembling wheat, to the king, with a letter written by Mr. William Halyburton, dated the 27th May, from Warwick, out of which letter I have made this extract.

" *Inſtead of news I ſend you ſome papers of wonders: On Saturday laſt it was rumoured in this town, that it rained wheat at Tuchbrooke, a village about two miles from Warwick. Whereupon ſome of the inhabitants of this town went thither, where they ſaw great quantities on the way, in the fields, and on the leads of the church, caſtle, and priory, and upon the hearths of the chimneys in the chambers. And* Arthur Mason, *coming out of Shropſhire, reports, that it hath rained the like in many places of that county. God make us thankful for this miraculous bleſſing*, &c.

" I brought ſome papers of theſe ſeeds, with this letter, to the ſociety at Greſham College, who would not enter into any conſideration of it, till they were better informed of the matter of fact. Hereupon, I entreated Mr. Henry Puckering to write to the bailiff of the town of Warwick, to the miniſters and phyſicians, to ſend us an account of the matter of fact, and their opinions of it. In the bailiff's letter, dated the 3d of June, I find this report verified, affirming, that himſelf, with the inhabitants of the town, were in a great aſtoniſhment at this wonder. But before the next day of our meeting, I ſent for ſome ivy-berries, and brought them to Greſham College, with ſome of theſe ſeeds reſembling wheat; and taking off the outward pulp of the ivy-berries, we found in each of the berries four ſeeds; which were generally concluded by the ſociety to be the ſame with thoſe, that were ſuppoſed and believed by the common people to have been wheat, that had been rained; and that they were

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[a] Regiſter-book, vol. i. p. 49.

" brought to thoſe places where they were found by ſtarlings, who, of all the " birds that we know, do aſſemble in the greateſt numbers, and do, at this time " of the year, feed upon theſe berries; and digeſting the outward pulp, they " render theſe ſeeds by caſting, as hawks do feathers and bones."

July 3. Mr. **POWLE** offered to the ſociety to employ himſelf in the country about any thing, which they ſhou'd direct him to.

He was deſired to ſpeak with Mr. **WREN** about the lunar globe, and the pictures of ſmall inſects by the miſcroſcope:

Mr. **CROUNE** to procure, againſt the next meeting, ſome freſh vipers; and the operator to provide freſh hazle-ſticks.

Mr. **EVELYN** preſented his relation of graving and etching; and, after public thanks returned to him, was requeſted to tranſcribe it.

The experiment of compreſſion of water was made by Dr. **GODDARD**, the account of which he brought in, and was deſired to proceed farther in it.

Dr. **WILKINS** and Dr. **GODDARD** were deſired to provide a glaſs fountain globe with a ſyringe from Greatericks.

It was ordered, that the amanuenſis nip up bubbles till they almoſt ſink, and try whether they will ſink by compreſſion of water in a glaſs-tube:

And that the experiment of two flat marbles be made at the next meeting.

Dr. **WILKINS** produced a letter from Mr. **WREN**.

July 10. Mr. **CROUNE** produced the vipers, and the operator the freſh hazle-ſticks, both ordered at the laſt meeting; with which the experiment was tried, but failed.

Mr. **CROUNE** and Mr. **VERMUYDEN** undertook to try the experiment of tormenting with the ſympathetic powder; and the amanuenſis was ordered to try the like with common vitriol.

A fountain-bottle was directed to be provided, without a pipe to the bottom, as alſo a ſyringe.

An account of the lord viſcount **BROUNCKER**'s *experiments of the recoiling of guns* was read by Mr. **ROOKE**, and preſented to the ſociety. Upon which, public thanks were returned to his lordſhip, and he was deſired to proſecute his experiments; and the account of them was ordered to be regiſtered; which was accordingly done[t]; and it was afterwards publiſhed by Dr. **SPRAT**[u].

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[t] Regiſter-book, vol. i. p. 143.

[u] Hiſt. of the Roy. Soc. p. 233.

The amanuenſis produced the nipped bubbles, according to order; and trial being made, they did not ſink by compreſſion of the water.

Mr. Rooke read his paper of obſervations of the eclipſes of the ſatellites of Jupiter; for which thanks were returned to him, and he was requeſted to publiſh it. It was entered into the regiſter-book [x], and printed by Dr. Sprat [y].

Mr. Boyle made his experiment of two flat marbles, and forty-two pounds was taken up by them.

Andrew Ellise, eſq; was propoſed as a candidate.

July 17. Sir Paul Neile having mentioned, that the king had, within four days paſt, deſired to have a reaſon aſſigned, why the ſenſitive plants ſtir and contract themſelves upon being touched; it was reſolved, that Dr. Wilkins, Dr. Clarke, Mr. Boyle, Mr. Evelyn, and Dr. Goddard, be curators for examining the fact relating to thoſe plants.

It was ordered, that glaſs-drops be made in aqua fortis and in oil of terebinthine: and that on the Friday following the diving engine ſhould be tried at Deptford.

Mr. Croune was deſired to keep the ſlow-worm, in order to ſee, whether the young one would eat through its belly.

In the interval between this and the ſubſequent meeting, Sir Robert Moray, the preſident of the ſociety, wrote the following letter [z], dated the 22d of July, 1661, and addreſſed to Monſieur de Montmor, preſident of the academy at Paris.

" Amplissime Vir,

" Cum ante dies aliquot ornatiſſimus vir, Tukius noſter, nobis narraret, quam
" eſſet in illuſtri conventu veſtro honorificè humaniterque exceptus, ſic affecit
" ea res ſocietatem noſtram, ut quanquam id eximiæ illius virtuti merito tributum
" fuiſſe credimus, tamen non difficile fuerit præclaram quoque erga nos volunta-
" tem veſtram inde manifeſto perſpicere. Præſertim verò cum porrò adjiceret,
" quam propenſo affectu ipſum de ratione inſtitutiſque ſocietatis noſtræ differen-
" tem audiveritis. Nempe aiebat ſeriò lætari vos, cœpta eſſe ab hominibus no-
" ſtris in pretio haberi ea ſtudia, quæ naturæ contemplationem, per aliquot retrò
" ſæcula turpiter neglectam jacentemque, erigant, & ad vitæ communis uſum tra-
" ducant. Quin cupere etiam vehementer ſocietatem veſtram (cui illa jampri-
" dem placuere) ut ea inter nos intercedant commercia, quæ optimam hanc ſtu-
" diorum neceſſitudinem in poſterum foveant. Quæ ſane exquiſitæ humanita-
" tis officia nobis à clariſſimis viris ultro delata ſummi honoris loco amplectimur.
" Enimverò & nobis in hoc ſtudio currentibus ab exemplo veſtro calcar ultrà addi

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[x] Vol. ii. p. 25. [y] Hiſt. of Roy. Soc. p. 183. [z] Letter-book, vol. i. p. 1.

“ libentèr fatemur ; ut adeò Gallia veſtra, ſi non omnem ſaniorem philoſophiam à
“ fundamentis conſtituiſſe, certe tamen illam nuperis annis exornâſſe plurimum
“ atque ampliâſſe dicenda ſit. Non jam neceſſe eſt magna illa nomina, Carte-
“ ſium atque Gaſſendum, in hujus rei fidem producamus, qui peculiari quodam
“ genio ad eam tractandam acceſſiſſe videntur : quorum philoſophandi rationem
“ non quidem è majorum commentariis, ſterilibus plerumque & infructuoſis, ex-
“ ſcriptam, ſed è rebus ipſis erutam, magni, ut par eſt, æſtimamus. Sicubi au-
“ tem viris maximis aut hærere aliquando, aut etiam, ut fit, ceſpitare contigerit,
“ dandum id profectò humanitati, cui nunquam in hâc obſcurâ rerum caligine
“ inoffenſo ſemper pede progredi licebit. Nobis idcirco, qui partem aliquam
“ longinqui hujus itineris conficere ſperamus, certum eſt imprimis neceſſarium
“ experimentorum commeatum inſtruere ; quæ & lucem errantibus accendant, &
“ offenſantes continuò ſublevent, & viæ moleſtias diluant. Namque, ut quod res
“ eſt dicamus, id unum hactenus philoſophiæ defuiſſe videtur, quod non ſatis ſe
“ exercuerint homines in hiſtoriâ naturæ rite adornandâ conquirendiſque bonæ
“ fidei experimentis, quibus, ceu firmiſſimæ ſubſtructioni, tota futuri operis mo-
“ les innitatur. Illudne verò inſuper addemus ? paulatim jam deſciſcere videri
“ philoſophantes à præſtantiſſimâ illâ magni Galilæi methodo, qui ita cum phi-
“ loſophiâ geometriam conjunxit, ut merito dicatur veteris ſapientiæ normam tem-
“ poribus noſtris primus reſtituiſſe ; quæ neminem ἀγεωμέτρητον ſacris ſuis initiari
“ voluit. Arduum omninò (inquies) opus, ipſaque vaſtitate pertimiſcendum ! Ita
“ profectò eſt, clariſſime MONTMORI, quodque omnium ſæculorum induſtriam fa-
“ cilè exhauriat. Quamobrem nos quoque eo fidentius adjutrices veſtras manus
“ expoſcimus, parati invicem, ſi quâ in re opera noſtra vobis uſui eſſe queat, no-
“ ſtrum qualemcunque apparatum in veſtram gratiam expromere. Pergite interim
“ philoſophari, viri ſpectatiſſimi, tuque præſertim, ampliſſime MONTMORI ; dum-
“ que philoſophiam ac muſas hoſpitio excipis, ædes tuas, ceu honori virtutive di-
“ catum templum, grata equidem poſteritas veneretur. Quod libens vovet

Amplitudinis veſtræ ſtudioſiſſimus,

Londini, 22 Julii,
1661.

Societatis ad tempus præſes,

R. MORAY.”

July 24. A report was made of the trial of the diving engine at Deptford on Friday preceding, by the amanuenſis ; who ſtayed in it eight and twenty minutes under water.

A circle was made with powder of unicorn's horn, and a ſpider ſet in the middle of it, but it immediately ran out.

The trial being repeated ſeveral times, the ſpider once made ſome ſtay on the powder.

Dr. GODDARD was deſired to provide for the experiment of the compreſſion of air in the immerſion in water.

July 31. Dr. Wilkins made his experiments of blown bladders, which being continued by him at the next meeting, he brought the following account of them in writing on the 14th of Auguſt, which was regiſtered [a]:

Experiments concerning the force of blowing with a man's breath.

“ Take the bladder of an ox or cow; faſten to the neck of it a pipe of about
“ a quarter of an inch bore, and ſix or eight inches long: let one end of the pipe
“ be trumpet faſhion, for the more convenient applying of the lip to it. If the
“ whole body of this bladder, to that very end where it is faſtened to the pipe,
“ be laid flat upon a table (all the air being firſt thruſt out) then a joint-ſtool,
“ turned upſide down, being ſet upon the bladder, and a fat boy of about ſixteen
“ or ſeventeen years old ſitting on the other end of the joint-ſtool, a man may,
“ by blowing this bladder, lift up the ſtool and boy about two inches. Let a
“ ſtring be faſtened to the lower end of this bladder, the other end of it being tied
“ by a chair or ſtool lying upon a table a little beyond the edge of the table: let
“ the other end of this ſtring, which hangs down, be faſtened to a weight on the
“ ground (ſuppoſe of fifty or an hundred pounds) let the ſtring be tied betwixt
“ the bottom of the bladder and the ring of the weight, that it may be partly
“ tenſe and not lax; then if one blow into this bladder, as that doth extend and
“ ſhorten, the weight will riſe from the ground about three or four inches.

“ If a ſquare box be made, open at one end, with a hole at the bottom or other
“ end, to put through the neck of the bladder and the pipe, each corner of this
“ bottom having a leg of about two or three inches long, to keep it from the ta-
“ ble; let the empty bladder be equally ſpread at the bottom of this box; then lay
“ upon the bladder thus ſpread a ſquare body, that may eaſily move within the
“ hollow of the box. Upon this board ſet one hundred and ten pounds weight,
“ or ſomewhat more. Then blowing at the pipe, this weight will aſcend about
“ five or ſix inches.

“ Note, If the bore of the pipe be much leſs, like that at the ſmall end of a
“ tobacco-pipe, a man ſhall not be able to ſtir this weight: ſo that it ſhould ſeem,
“ that there is a certain proportion to be obſerved in the bore of the pipe, beyond
“ or ſhort of which, the blowing of the ſame man will not be of the ſame force.

“ Quære, Whether this proportion be not anſwerable to that in the *aquæ ſa-*
“ *lientes*.”

Mr. Croune produced a glaſs-jar, full of the powder of the bodies of vipers, and a gallipot full of the powder of only the hearts and livers of vipers.

Dr. Wilkins was deſired to procure pipes of ſeveral bores to be made, for the experiment of blowing up weights:

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[a] Regiſter-book, vol. i. p. 57.

Sir **Robert Moray** to bring ſome of the ſeeds of the ſenſitive plants: And

Dr. **Whistler** to communicate in writing his thoughts concerning gravitation and ſprings.

Mr. **Henshaw** exhibited the ſpirals of nut-trees, ſhewing, that they grow ſnail-wiſe.

Aug. 7. Mr. **Pellin**'s letter, concerning the regeneration of vipers, was ordered to be filled up.

Mr. **Henshaw** produced a ſtone called *Aſtroites* or *Lapis Stellaris*, of which the following account is regiſtered [b]; That it moved with a little vinegar upon a declining plate ſeveral times repeated; and that it was obſerved, that the ſtone grew ſomewhat hot, and brake at the top. It is to be remarked, that there are two ſorts of Aſtroites, the one marked with ſtarry ſpots, and the other ſtellate in its form.

Mr. **Palmer** brought in a powder, reported to be that of a vegetable, which, thrown into the flame of a candle, burns and ſparkles with a noiſe like that, which is made by looſe corns of gun powder. It is ſaid to have been brought an hundred miles beyond [illegible], out of the mountains; and it is uſed by the people of that country chiefly for ulcers [c].

Dr. **Wilkins** was deſired to try ſalt-petre in water, to ſee if it increaſed in bulk: And

Sir **John Finch** to bring in a piece of an hat-band, made of *Lapis aſbeſtos*.

It was ordered, that a trial be made of cooling wine with a wet cloth, with an hot iron, and with hot water: And

That copies be made of the account of glaſs-drops.

Aug. 14. Sir **Robert Moray** brought in glaſs-drops, with cement about them; of which the following account is regiſtered [d]:

" They are made of green glaſs, well refined.

" Till the metal, as they call it, be well refined, they do not at all ſucceed, " but crack and break ſoon after they are dropped into the water.

" The beſt way of making them is, to take up ſome of the metal out of the pot, " upon the end of an iron rod, and immediately let it drop into cold water, and " there lie till it cool.

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[b] Regiſter-book, vol. i. p. 56. [c] Ibid. [d] Ibid. p. 51.

“ If the metal be too hot when it drops into the water, the glaſs-drop certainly froſts and cracks all over, and falls to pieces in the water.

“ Every one, that cracks not in the water, and lies in it till it be quite cold, is ſure to be good.

“ The moſt expert workmen know not the juſt temper of heat, that is requiſite, and therefore cannot promiſe before-hand to make one, that ſhall prove good; and many of them miſcarry in the making, ſometimes two, or three, or more, for one that hits.

“ Some of them froſt, but the body falls not into pieces; others break in pieces before the red-heat be quite over, and with a ſmall noiſe; others, ſoon after the red-heat is over, and with a great noiſe: ſome neither break nor crack, till thy ſeem to be quite cooled; others keep whole whilſt they are in the water, and fly to pieces of themſelves, with a ſmart noiſe, as ſoon as they are taken out of the water; ſome an hour after, others keep whole ſome days, or weeks, and then break without being touched.

“ If one of them be ſnatcht out of the water whilſt it be red hot, the ſmall part of the neck, and ſo much of the thread or ſtring it hangs by as has been in the water, will upon breaking fall into ſmall parts; but not the body, though it have as large cavities in it as thoſe that fly in pieces.

“ If one of them be cooled in the air hanging to the thread, or on the ground, it becomes like other glaſs in all reſpects, as ſolidity, *&c.*

“ When a glaſs-drop falls into the water, it makes a little hiſſing noiſe, the body of it continuing red a pretty while; and there proceed from it many eruptions like ſparkles, that crack and make it move and leap up; and many bubbles do riſe from it in the water every where about it, till it cool: but if the water be ten or twelve inches deep, theſe bubbles diminiſh ſo in the aſcending, that they vaniſh before they attain the ſurface of the water, where nothing is to be obſerved but a little thin ſteam.

“ The outſide of the glaſs-drop is cloſe and ſmooth like other glaſs, but within it is ſpongeous, and full of cavities or blebs.

“ The figure of it is roundiſh at the bottom, for the moſt part not unlike a pear-pearl; it terminates in a long neck, ſo that never any of them are ſtrait, and moſt of them are crooked and bowed into ſmall folds and wreaths, from the beginning of the neck till it end in a ſmall point.

“ Almoſt all thoſe, that are made in water, have a little protuberance or knob a little above the largeſt part of the body, and moſt commonly placed on the ſide, towards which the neck bends; though ſometimes it be on that ſide, which lies uppermoſt in the veſſel where it is made.

" If a glaſs-drop be let fall into water ſcalding hot, it will be ſure to crack " and break in the water, either before the red-heat be over, or ſoon after.

" In ſallet oil they do not miſcarry ſo frequently as in cold water.

" In oil they produce a greater number of bubbles, and larger ones, and the " bubbling laſts longer than in water.

" Thoſe, that are made in oil, have not ſo many nor ſo large blebs in them " as thoſe made in water; and divers of them are ſmooth all over, and want thoſe " little knobs the others have.

" Some part of the neck of thoſe, that are made in oil, and that part of the " ſmall thread, that is quenched in it, being cooled, breaks like common glaſs: " but if the neck be broken near the body, and the body held cloſe in one's hand, " it will crack and break all over; but flies not into ſo ſmall parts, nor with ſo " ſmart a force and noiſe as thoſe made in water; and the pieces will hold together till they be parted: and then there appears long ſtreaks or rays upon them, " pointing towards the center or middle of the body, and thwarting the little blebs " or cavities of it; whereof the number is not ſo great, nor the ſize ſo large, as in " thoſe made in water.

" If the glaſs-drops be dropped into vinegar, they froſt and crack ſo as they are " ſure to fall to pieces before they be cold. The noiſe at falling in is more hiſſing than in water, but the bubbles are not ſo remarkable.

" In milk they make no noiſe, nor any bubbles that can be perceived; and " never miſs to froſt and crack, and fall in pieces before they be cold.

" In ſpirit of wine they bubble more than in any of the other liquors; and " while they remain entire, tumble to and fro, and are more agitated than in other " liquors, and never fail to crack and fall in pieces.

" By that time five or ſix are dropped into the ſpirit of wine, it will be ſet on " flame; but receives no particular taſte by them.

" In water, wherein nitre or ſal armoniac is diſſolved, they ſucceed no better " than in vinegar.

" In oil of terebinthine, one of them broke as in the ſpirit of wine; but the " ſecond ſet it on fire, ſo as it could no more be uſed.

" In quickſilver, being forced to ſink with a ſtick, it grew flattiſh and rough on " the upper ſide: but the experiment could not be perfected, becauſe it could not " be kept under till it cooled.

" In an experiment made in a cylindrical glaſs like a beaker, filled with " cold water, of ſeven or eight only one ſucceeded, the reſt all cracking and

“ breaking into pieces: only ſome of the company, taking the glaſs in their hand as ſoon as the drop was let fall into it, obſerved, that at the firſt falling in, and for ſome time after, whilſt the red-heat laſted, red ſparks were ſhot forth from the drop into the water; and that at the inſtant of the eruption of thoſe ſparkles, and of the bubbles, which manifeſtly break out of it into the water, it not only crackles, and ſometimes with conſiderable noiſe, but the body moves and leaps, as well of thoſe that remain whole in the water, as thoſe that break.

“ A blow with a ſmall hammer, or other hard tool, will not break one of the glaſs-drops made in water, if it be touched no where but upon the body.

“ Break off the top of it, and it will all fly immediately into very minute parts with a ſmart force and noiſe; and theſe parts will eaſily crumble into a coarſe duſt.

“ If it be broken ſo as the ſparks of it may have liberty to fly every way, they will diſperſe themſelves in an orb with violence like a little granado.

“ Some being rubbed upon a dry tile, fly into pieces by that time the bottom is a little flatted: others not till half be rubbed off. One being rubbed till about half was ground away, and then laid aſide, did a little while after fly into pieces, without being touched. Another rubbed almoſt to the very neck on a ſtone with water and emeril, did not fly at all.

“ If one of them be broken in one's hand under water, it ſtrikes the hand more ſmartly, and with more briſk noiſe than in the air: yet though it be held near the ſurface, none of the ſmall parts will fly out of it; but all fall down without diſperſing, as they do in the air.

“ One of them broken in Mr. BOYLE's engine, when the receiver is well evacuated, will fly in pieces as in the open air.

“ Anneal one of them in the fire, and it will become like ordinary glaſs; only the ſpring of it is ſo weakened, that it will not bend ſo much without breaking as before.

“ A glaſs-drop being faſtened into cement, all but a part of the neck, and then the tip of it broken off, it made a pretty ſmart noiſe, but not ſo great as thoſe uſe to do, that are broken in the hand: and though it clearly appears to be all ſhivered within, and the colour turned greyiſh, the outſide remained ſmooth though cracked; and being taken in pieces, the parts of it riſe in flakes, ſomewhat conical in ſhape, and ſo cracked all over, that it eaſily crumbled into duſt.

“ One faſtened in a ball of cement ſome half an inch in thickneſs, upon breaking off the tip of it, it broke the ball in pieces like a granado.

" Two or three of them being ſent to a lapidary, to pierce them through as
" they do pearls, no ſooner had the tool entered into them but they flew in pieces,
" as they uſed to do when the tip of them is broken off."

Mr. Oldenburg exhibited a piece of camphire wood.

Dr. Wilkins brought in a glaſs-bottle fountain, for trying the compreſſion of water.

Sir Kenelme Digby preſented the ſociety with ſome copies of his *Diſcourſe concerning the vegetation of plants*, ſpoken to the ſociety on the 23d of January 166$\frac{0}{1}$, and now printed at London in 8vo.

He alſo produced a piece of wood, which, upon a trial made with a blaſt-pipe, proved incombuſtible.

Sir William Petty[d] promiſed to ſend for ſome of the pieces of a rock in Wales like incombuſtible wood.

Mr. Boyle undertook to try the compreſſion of air and water by his engine with quickſilver.

Mr. Croune was deſired to bring in an account of his experiment of bladders and water.

Mr. Henshaw read his *Hiſtory of the making of ſaltpetre*, for which thanks were returned to him; and it was ordered to be regiſtered[e], and was afterwards publiſhed by Dr. Sprat[f].

Sir Robert Harley was propoſed a candidate by Mr. Slingesby.

Sir John Finch's piece of an incombuſtible hat-band was produced.

Mr. Colwall read his *Relation concerning the making of alum*, for which he received the thanks of the ſociety, and his paper was ordered to be regiſtered[g].

Sir William Petty was deſired to bring in the hiſtory of the dyers trade; which he promiſed to do.

Sir Thomas Notte, Sir Robert Harley, Mr. William Aerskine, Mr. Stanley, and Mr. Ellise were elected into the ſociety.

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[d] He had been knighted on the 11th of April, 1661.

[e] Regiſter-book, vol. i. p. 50.

[f] Hiſt. of the Royal Society, p. 260.

[g] Regiſter book, vol. i. p. 83. It is printed in the Philoſophical Tranſactions, vol. xi. n° 142. p. 1052.

Mr. Croune was deſired to procure ſalt of cabbage, and to try, whether it would deſtroy the taſte of wine, as it was reported to do.

Mr. Boyle preſented the ſociety with the Latin tranſlation of his *New experiments phyſico-mechanical touching the ſpring of the air and its effects.*

Dr. Clarke read a paper entituled, *Obſervations on the humble and ſenſible plants in Mr.* Chiffins's *garden in St. James's Park, made Auguſt* 9, 1661; *preſent the lord* Brouncker, *Sir* Robert Moray, *Dr.* Wilkins, *Mr.* Evelyn, *Dr.* Goddard, *Dr.* Henshaw, *and Dr.* Clarke: which was ordered to be regiſtered [h].

Auguſt 28. Mr. Boyle preſented the ſociety with the book, which he had publiſhed ſince the order was made, that every member, who ſhould publiſh any book, ſhould give one to the ſociety's library.

The experiment made by Mr. Croune with a bladder and water in it was directed to be farther proſecuted againſt the next meeting; and the reſult of it committed to writing.

Mr. Oldenburg read a part of a letter from Mr. Borrhi, concerning the making of incombuſtible wood.

He alſo tried the experiment of ſalt of cabbage in wine, but it did not ſucceed according to the report, that it would make wine inſipid; though it much abated of the taſte, and made it a mixture of vinous and lixivious.

It was ſuppoſed, that all lixiviate ſalts would do the ſame.

Sir Cyril Wyche and Jaspar Needham, M.D. were admitted into the ſociety.

Dr. Pockley was propoſed as a candidate by Dr. Wilkins.

The deſcription of the iſland Hirta was brought in by Sir Robert Moray, and was ordered to be regiſtered [i].

September 4. Sir Cyril Wyche and Dr. Needham ſubſcribed their names.

Mr. Mungo Moray was propoſed as a candidate by Sir Robert Moray.

A propoſition of Mr. Hobbes *for finding two mean proportionals between two ſtrait lines given*, was delivered into the ſociety by Sir Paul Neile from the king, indorſed with his majeſty's own hand, and was ordered to be regiſtered [k]; as was afterwards the anſwer to the problem, by lord viſcount Brouncker [l].

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[h] Regiſter book, vol. i. p. 90. It is printed in Mr. Hook's Micrographia, p. 66.

[i] Regiſter-book, vol. i. p. 95. It is printed in the Philoſophical Tranſactions, vol. xi. nº 137. p. 927.

[k] Regiſter book, vol. i. p. 99.

[l] p. 101.

Mr. CROUNE ſhewed his experiment with bladders and water, which ſucceeded very well; and he was deſired to bring in an account of it in writing.

Sir KENELME DIGBY communicated a letter from a friend of his in Florence, written in 1656, concerning a petrified city and inhabitants [m]; which was ordered to be regiſtered [n].

He read alſo a French letter from Monſieur FRENICLE to himſelf, dated at Paris, the 31ſt of Auguſt 1661, N. S. concerning that gentleman's hypotheſis of the motion of Saturn [o]; and was deſired to write to Mr. FRENICLE, and to return him the thanks of the ſociety.

Mr. WREN was deſired likewiſe to deliver a copy of his obſervations and hypotheſis of Saturn to the amanuenſis, to be tranſmitted by Sir KENELME DIGBY to Monſieur FRENICLE.

Mr. CROUNE was requeſted to procure a ſyphon of glaſs to be made, with the end nipt up, in order to try the compreſſion of air with quickſilver; and alſo to try an experiment with the weight of liquors in a ſyphon.

Sir KENELME DIGBY was deſired to draw up ſome notes upon Mr. HENSHAW's *Hiſtory of making ſaltpetre.*

The amanuenſis was ordered to make againſt the next meeting the experiment with ſpirit of wine, and a wax-candle, to be burnt in it in a porringer.

Col. TUKE delivered in a Latin letter from Monſieur de SORBIERE, ſecretary of the academy at Paris, to Sir ROBERT MORAY, preſident of the ſociety; and another in French from the ſame gentleman to Col. TUKE; both which letters were read by Col. TUKE, and ordered to be regiſtered [p]. The former was in anſwer to Sir ROBERT MORAY's letter to Monſieur de MONTMOR, inſerted above, and was in theſe terms:

Nobiliſſimo ac ſapientiſſimo viro D. MORO *equiti, & celeberrimæ academiæ Londinenſis phyſicæ præſidi,* SAMUEL SORBERIUS, χαίρειν καὶ εὐπράττειν.

“ Cum ad virum illuſtrem dominum HABERTUM MONMORIUM perlatæ fue-
“ runt epiſtolæ tuæ, nobiliſſime domine, tota in luctu & mœrore jacebat familia
“ Monmoriana, ob ægritudinem matris-familias, quæ nondum planè convaluit, &
“ liberorum mortem. Ego autem in aulâ verſabar; plerique unà philoſophantium
“ rus conceſſerant (ut moris eſt Lutetiæ eâ anni tempeſtate): cœtus eruditorum
“ nullus erat; & omninò jacebant ſtudia noſtra philoſophica. Primus omnium
“ in urbem redii, ſed forſan quamprimùm profecturus iterum, rebus ſcilicet non-
“ dum in ædibus Mæcenatis noſtri juxta vota noſtra ritè compoſitis, & amicis
“ adhuc nonnullis vel in Armoricam regem comitantibus, vel ad alia privata nego-

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[m] Probably that ſuppoſed to be in Africa. [n] It does not appear in the Regiſter. [o] Letter-book, vol. i. p. 13. [p] Letter-book, vol. i. p. 4 and 6.

“ tia procul ab urbe intentis. Itaque D. MONMORIUS, qui in illo animi angore, in quo luctatur nunc cum morborum cohorte, quæ domum illuſtriſſimam obſidet, par ſibi non videtur adornando tibi reſponſo, juſſit ut calamo manum admoverem, & in ejus partes aliquatenus venirem. Id ego muneris libenter in me ſuſcepi, qui nihil prius habui à puero, quam ut ſummos viros adirem, mirarer, cultûs mei certiores facerem, & hiſce functus officiis doctior demum vel melior evadærem. Gratias igitur tibi, vir doctiſſime, præſes noſter ſapientiſſimus debitas per me refert; uberiores olim redditurus, cum nova rerum facies lætiorque redierit. Et magno quidam lucro optimus ille virorum apponet, atque ſummo honori ducet, ſi ea ſemper mens nobiliſſimo & eruditiſſimo conſeſſui veſtro conſtiterit, ut cum noſtro qualicunque literarum commutatio fiat, atque adeo experimentorum & ratiociniorum circa res phyſicas communicatio. In iſta autem ἀλληλογραφία verendum tibi foret, vir illuſtriſſime, ne aurea pro æneis rependeres, ſi mea opera ſemper uti conſtitutum eſſet, vel ſi eo, quo nunc ſe habent, modo ſtudia noſtra ſemper procederent. Verum ſperamus, alacriores nos brevi ad intermiſſa opera redituros: nec deſunt enim nobis viri præſtantiſſimi ad ſtrenuè agendum parati: ſed, ut rem ingenuè eloquar, deſunt nobis, quod in primis invidendum venit Angliæ veſtræ fortunatiſſimæ, magnates & principes, qui regem in amorem ſtudiorum iſtorum pertrahant, vel qui ipſi talibus ſtudiis capiantur Quam pauci enim ſunt MONMORI, Sourdiſii, Laudunenſes epiſcopi, qui muſis litent, & ſumptus nonnullos ad promovenda vitæ humnæ commoda non refugiant! O vos felices! quibus referta eſt hujuſcemodi viris patria; quibus rex ſereniſſimus, ceu benignè fulgens ſol, prælucere dignatur; & quibus datum eſt non ſolum ſagacitate ingenii, ſed iteratis experimentis, & in univerſum orbem terrarum longè latéque diffuſis ſapientiæ veſtræ radiis, auſu præclaro & immortalitate digno, talia tantaque ſuſcipere! Patere, vir nobiliſſime, ut deinceps te & cœtum tuum illuſtriſſimum eminus colam; atque, ſi datur aliquando proprius Deos contingere, & in Angliam, quod jam pridem geſtio, tranſcurrere, obſequii & cultûs mei, non certiora quidem, ſed evidentiora pignora tradere. Ita valeas exopto, & cœptis tuis fauſta omnia adprecor. Lutetiæ Pariſiorum a. d. vi. Kal. Sept. A. S. R. CIↃIↃCLXI.”

After reading this and the other letter of Monſieur de SORBIERE, a book was ordered to be provided for the regiſtering of letters only.

Dr. GODDARD was deſired to bring in writing an account of the experiments made by him in the great water-tube with glaſs-windows.

He then made an experiment with two cylinders of glaſs, one within the other, with quickſilver and water; cauſing by five ounces of water eight or ten grains of quickſilver to riſe an inch and a quarter high.

Mr. BOYLE was deſired to bring in at the next meeting his experiment of this kind.

It was ordered, that a collection of all quickſilver experiments be made, examined, and brought in by Mr. OLDENBURG.

Mr. GREATERICK's compreſſion of water was promiſed againſt the next meeting.

September 11. Sir THOMAS NOTTE, Mr. WILLIAM AERSKINE, and the lord MASSAREENE ſubſcribed their names.

JOHN CLAYTON, eſq; was propoſed as a candidate.

RICHARD JONES, eſq; was admitted and ſubſcribed his name.

Mr. MUNGO MORAY and Dr. POCKLEY were elected.

It was reſolved, that Sir WILLIAM PETTY be put in mind to proſecute his demonſtrations about ſhip-building.

Two committees were appointed to propound experiments, one conſiſting of Dr. GODDARD, Dr. WILKINS, Dr. ENT, Dr. WHISTLER, and Mr. CROUNE, for the city of London; and the other conſiſting of the lord viſcount BROUNCKER, Sir ROBERT MORAY, Sir PAUL NEILE, Mr. SLINGESBY, and Dr. CLARKE, for Weſtminſter.

Mr. CROUNE produced two experiments, one of the compreſſion of the air with quickſilver in a crooked tube of glaſs, the nipt end of which broke; and the other with a cork kept down at the bottom of a cylinder of water in a veſſel perforated at the bottom, over which the cork was laid; upon ſtopping of which foramen, and the pouring in of water, the cork immediately roſe.

Mr. BOYLE gave an account of his having made the former of theſe experiments by compreſſing twelve inches of air to three inches, with about an hundred inches of quickſilver.

September 18. Dr. GODDARD was deſired to continue his experiment of water.

It was reſolved, that the petition, which Sir ROBERT MORAY read to the ſociety, be delivered to the king in the name of the ſociety.

The experiment was made of ſpirit of wine and the end of a wax-candle, the flame of which was not orbicular, as it had been ſaid it would be, nor turned round; but after a while the candle was extinguiſhed, the ſpirit continuing to burn.

The ſolutions of ſeveral ſalts were ordered to be tried in one liquor.

Mr. BOYLE brought in his account in writing of the experiment made by him of the compreſſion of air with the quickſilver tube; which was ordered to be regiſtered[1].

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[1] Regiſter-book, vol. i. p. 103.

Sir **Kenelme Digby** read a letter in French from Monſieur **Christian Huygens de Zuylichem** to Sir **Robert Moray.**

The lord viſcount **Brouncker** was deſired to try the acceleration of falling bodies by pullies or otherwiſe:

Dr. **Henshaw** to try to ſink a glaſs in Dr. **Goddard**'s engine for immerſion.

Dr. **Wilkins** remarked, that he thought, that he could make it appear, that the bladder of a fiſh did not contribute to its ſwimming.

Sir **Robert Moray** was deſired to try, whether the ſame weight, that will ſink a board edge-wiſe, will ſink it flat-wiſe.

September 25. Mr. **Croune** was deſired to try ſome experiments of the weights of liquors:

The lord viſcount **Brouncker** to make the experiments of two pendulums:

Dr. **Goddard** to proſecute his trials of ſinking bodies under the ſurface of the water:

Dr. **Charlton** to try the experiment of the freezing of ſalt water.

Sir **William Petty** promiſed his diſcourſe on clothing.

October 2. Sir **Robert Moray** produced unnealed glaſs hollow balls with a ſmall hole in them; which being held in the hand till they were heated (the hole thereof being ſtopped with the palm of the hand) would fly into pieces.

The lord viſcount **Brouncker** was deſired to try the experiment of two pendulums:

Dr. **Goddard** to try the velocity of ſinking bladders in water, and the lord viſcount **Brouncker** in air:

Dr. **Ent** to give in writing ſome conſiderations, why it is hotter in ſummer than in winter.

It was reſolved, that it be debated at the next meeting about appointing or altering the time of the ſociety's meeting.

Dr. **Glisson** ſubſcribed his name.

The amanuenſis was ordered to provide againſt the next meeting two balls of equal bigneſs, the one of lead, and the other of cork.

He promiſed to procure a ſtone, which being opake would grow tranſparent in cold water.

October 9. A living chameleon was preſented to the ſociety from Mr. Clayton by Dr. Henshaw.

Mr. Povey propoſed to the ſociety to procure a correſpondency in Africa.

Mr. Croune, Dr. Pope, and Mr. Rooke were appointed a committee to view the propoſitions for inquiries in foreign parts.

Dr. Ent brought in his reaſon of the heat in ſummer, and cold in winter; which was read by the lord viſcount Brouncker, and ordered to be regiſtered in a book of theories, which was directed to be provided.

Mr. Clayton was admitted into the ſociety.

The lord viſcount Brouncker read a letter of Dr. Christopher Wren[s] to Sir Paul Neile, concerning his hypotheſis of Saturn; which letter was ordered to be entered in the letter-book[t]. It was dated at Oxford, October 1, 1661, and was as follows:

“ Honoured Sir,

“ You know of what prevalency your commands alone are with me, although
“ they had not been ſeconded by the votes of the beſt ſociety of Europe; to diſ-
“ obey which would not be rudeneſs alone, but Gothiſm and enmity to the progreſs
“ of learning. Yet if it were not my reſolution, that I ought to ſuffer any thing
“ rather than be deficient to ſo much duty, you ſhould not have obtained of me
“ to expoſe myſelf ſo many ways, as I muſt of neceſſity do in this little trifle,
“ the hypotheſis of Saturn. For had it been ſo fortunate to come into your hands,
“ while it could have told you any news, it might poſſibly have been as well re-
“ ceived as the firſt meſſenger of a victory is wont to be, though he brings but
“ an imperfect ſtory. But when Hugenius hath outrid me, who ſtayed to bring
“ a fuller relation, to give you a ſtale account will undoubtedly be as pleaſant a
“ thing to you, as unſeaſonable well-meanings are wont to be, but cannot give
“ you any ſerious ſatisfaction. I muſt confeſs, I have often had the puſillanimity
“ rather to neglect that right I might in juſtice have vindicated, than by chal-
“ lenging it too late, incur the jealouſy of being a plagiary. And ſince you it is,
“ that will not ſuffer me to continue in this peaceable humour, I ſhall not need to
“ fear, that you will entertain any ſuch ſuſpicion, eſpecially ſince this kind of Sa-
“ turn was long before hatched by your influence at White-Waltham, upon the
“ obſervation of December, 1657, when firſt we had an apprehenſion, that the
“ arms of Saturn kept their length, which produced this hypotheſis, made firſt
“ in two paſt-boards; not to ſay any thing of our attempts in wax, in Jan. 1655.

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[s] He was created doctor of the civil law, Sept. 12, 1661. [t] Vol. i. p. 16.

“ The hypotheſis made more durable in metal was expoſed on the top of that obeliſk, which was erected at Greſham College in May, 1658. (if I miſtake, be pleaſed to rectify me) to raiſe the thirty-five feet teleſcope of your donation. At the ſame time I was put upon writing on this ſubject, for which I ſuppoſed I had tolerable obſervations and materials at hand. But firſt, I was enjoined to give that ſhort and general account of it, which about that time I drew up in this ſheet. But when, in a ſhort while after, the hypotheſis of Hugenius was ſent over in writing, I confeſs I was ſo fond of the neatneſs of it, and the natural ſimplicity of the contrivance agreeing ſo well with the phyſical cauſe of the heavenly bodies, that I loved the invention beyond my own: And though this be ſo much an equipollent with that of Hugenius, that I ſuppoſe future obſervations will never be able to determine which is the trueſt, yet I would not proceed with my deſign, nor expoſe ſo much as this ſheet any farther than to the eye of my boſom friend, to whom even my errors lie always open. Neither had I now been perſuaded to it, but that I could not endure a regreſs in a real learning, having always had a zeal for the progreſs of it: And to ſee ingenious men neglecting what was determined before, to do worſe on the ſame ſubject, becauſe they would do otherwiſe, was always wont to make me paſſionate: And therefore I could not, with charity, ſuffer a perſon (whoſe great wit unuſefully tried would be a loſs to the world) to trouble himſelf with this leſs conſiderable hypotheſis; which if he had known not to be new, he had certainly deſpiſed: And yet it is very well adviſed of him, that we ſhould not ſo build upon Hugenius's hypotheſis, as to neglect the obſervations about the full phaſis; which, till they are obtained, little more can be determined in this thing, than what Hugenius hath done. And therefore, though I might have taken occaſion, together with this old paper, to have lent ſome thoughts, and have ſuggeſted ſome new hypotheſes; yet conſidering they would as yet be but mere conjectures, I have let alone thoſe thoughts. And if it be ſuſpected, that any thing ſaid in this ſuperficial draught of Saturn be of this ſort, that is, contrived ſince the ſeeing of Hugenius's, I have a double appeal to make; one to my honoured friend Mr. Rooke, who at firſt ſaw the only copy; and another to the ſtyle, which ſpeaks I had not yet uſed the induſtry to refine it, above what might have proceeded from my childiſh pen, having not then been ſo ſufficiently convinced of the neceſſity of words as well as things: neither would I change it now, that I might be conſcious to myſelf of ſincerity, but where too much obſcurity in the expreſſion only forced me in two or three places. For theſe reaſons, I earneſtly beg this favour of you (as a friend I deſire it) that you would keep it in your hands, and reſtore it again; which, as the caſe ſtands, will give me almoſt as much ſatisfaction, as if I had found the confidence to have excuſed myſelf, when it was enjoined me at the ſociety; which I might well have done, conſidering that divers there had been at the trouble to hear the aſtronomy reader at Greſham give fuller diſcourſes on the ſame ſubject[a], which he thought then was publication enough, and might have ſaved

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[a] The original manuſcript of a lecture of his read at Greſham College, intituled, *De corpore Saturni ejuſque phaſibus hypotheſis*, was in the library of the late William Jones, eſq; F.R.S. which library is now in the poſſeſſion of the right honourable George earl of Macclesfield, preſident of the Royal Society.

“ the impertinency of theſe apologies for that, which he thinks deſerves not now “ ſo much of his care, otherwiſe than as it is a command from them to

Oxford, Oct. 1,
1661.

Your moſt obedient humble ſervant,

CHRISTOPHER WREN.”

After the reading of Dr. Wren's letter, Sir Robert Moray read one, in French, from Monſ. Christian Huygens de Zuylichem, dated at the Hague, 24 July, 1661, N. S. containing ſome obſervations on Saturn [w]; which letter was ordered to be entered [x]. In it he takes notice, That he had obſerved, for ſeveral days paſt, Saturn with his teleſcope, and had ſeen diſtinctly, that there was not the leaſt part of the globe of that planet, which advanced out of the oval of its ring, either above or below; which could not have been ſo, according to the proportion of the diameter of the ring and the globe, which he had laid down to be as 9 to 4. That he had found therefore, that it was neceſſary to ſuppoſe the ring greater in proportion; and that its diameter to that of the globe ought to be at leaſt as 17 to 6. That he had procured a model of Saturn to be made with a circle of braſs, like that which he had ſeen at Sir Robert Moray's, but in the proportion above-mentioned; and having ſurrounded the whole with white paper, he found, that being ſeen at a diſtance, and well enlightened, it produced very exactly all the phaſes. He rubbed the paper with chalk, which made it appear equally white throughout. He remarked in the ſame letter, that he had been informed by a letter from Paris, that the academy, which met at Monſ. de Montmort's, was excited again by emulation of the ſociety of London, and would apply themſelves to experiments preferably to any other employment, in which genius only was concerned. This, adds he, is a good effect produced from your example. He concluded with deſiring to be acquainted, by Sir Robert Moray, from time to time, with what paſſed in the ſociety, for whoſe eſtabliſhment and intereſts he declared himſelf no leſs zealous, than any one of the members, who compoſed it.

Oct. 16. Six balls of a like ſize were produced, one of lignum vitæ, one of ſtone, two of tin, and two of lead; to try their different velocity of ſinking in water, or falling down in the air.

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[w] Monſ. Huygens had publiſhed at the Hague, in 1659, in 4to, *Syſtema Saturnium, ſive de cauſis mirandorum Saturni phænomenon & comite ejus planetâ novo*; in which he deſcribes the various phaſes of Saturn, and ſhews, that the *brachia* or *anſæ* are no other than a luminous ring about the body of that planet, every way alike diſtant from it; and that the planet keeps in a certain and conſtant inclination to the ecliptic, appearing (according to its diverſity of aſpect) now like a large ellipſis, now like a more contracted one; at other times like a ſtrait line: that there is likewiſe a *lunula*, or ſmall planet, moving about Saturn, and finiſhing its courſe in ſixteen days: and that Saturn in a leſs ſpace of time turns about its own axis, carrying about with him the whole ethereal body or matter between him and the ſaid ſatellite or planet, together with the ſaid ring, in a motion not much ſlower than his own. He publiſhed, the year following, at the Hague, in 4to, *Brevis aſſertio ſyſtematis Saturnii*, in anſwer to *Euſtachius de Divinis*.

[x] Letter-book, vol. i. p. 19.

Dr. Pope[y] made his experiment of breaking pebbles with his hand; which ſucceeded very well.

Mr. Oldenburg read a paper concerning a liquor to be had out of animals like the alkaheſt[z]; which was referred to the phyſicians of the ſociety.

It was ordered, that ſalt of tartar, vitriol, common ſalt, ſalt-petre, and alum be diſſolved in water, in order to ſee whether they increaſe in bulk.

Mr Greatoricks tried what he could do in the compreſſion of water; but being not then prepared, he did not ſucceed.

Dr. Needham propoſed the Indian varniſh.

Dr. Merret and Sir William Petty were deſired to bring in their account of dying.

Dr. Whistler promiſed to communicate his account of ſprings.

Sir Robert Moray acquainted the ſociety, that he and Sir Paul Neile had kiſſed the king's hand, in the ſociety's name; and he was deſired by them to return their moſt humble thanks to his majeſty for the reference, which he was pleaſed to grant of their petition; and for the favour and honour done them, of offering himſelf to be entered one of their ſociety.

Oct. 23. Dr. Wilkins preſident.

It was ordered, that it be referred to Dr. Goddard, to make inquiries about the liquor of animals like the alkaheſt.

Mr. Rooke, Mr. Croune, and Dr. Pope, were requeſted to make the experiment of the diſſolution of ſalts againſt the next meeting.

Dr. Needham promiſed to communicate an account of Indian varniſh at the next meeting.

Dr. Merret and Dr. Clarke were deſired to bring in their account of trades at the next meeting:

Dr. Goddard to give in writing a brief account of his obſervations made in the diſſection of the chameleon.

Mr. Croune read ſome account of experiments of mercury made by Dr. Power[a], at the bottom and top of Hallifax-hill; which account was ordered to be filed up. He was deſired to provide, againſt the next day, a glaſs tube, and to bring in an account of the bladders; and to examine the mechanics of Schottus [b], as Mr. Rooke was the ſounds, and Dr. Pope the optics, of that writer; and to conſider what experiments mentioned by him are worth trying, and to propoſe them to the ſociety.

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[y] He had been created doctor of phyſic at Oxford, 12 Sept. 1661.

[z] A word invented by Paracelsus to expreſs an univerſal menſtruum or ſolvent.

[a] Henry Power, M. D.

Oct. 30. Mr. Clayton ſubſcribed his name.

Mr. Croune made the experiment of ſteeping the ſtone brought by the amanuenſis into cold water; upon which it grew wholly tranſparent, and in the air it returned to its former opacity.

Dr. Goddard delivered in inquiries concerning the liquor alkaheſt, made of animals; and they were ordered to be fairly written, and given to Mr. Oldenburg.

It was ordered, that the deſcription of the liquor alkaheſt be tranſcribed and kept: And

That the account of the ſolution of ſalts be called for at the next meeting.

Dr. Needham read the following account of China varniſh; which was ordered to be regiſtered [c].

" A pint of the beſt rectified ſpirit of wine; gum lacca, the reddeſt and cleareſt, " four ounces; ſandaraca one ounce; put all into a bolt-head, cloſe it well, and " let them infuſe the ſpace of four and twenty hours upon ſand gently hot; af" terwards increaſe the fire, that it may boil a little, till the gums be thoroughly " melted; then paſs it through a fine cloth, and keep it in a glaſs well ſtopped.

" The wood to be varniſhed muſt be ſmooth, clean, and neat (ſuch as pear" tree) without fiſſure or holes; and if any be found, they muſt be ſtopped with " a paſte made of gum tragacanth, incorporated with ſome of the colour you in" tend to ſuperinduce. Being thus prepared, and well ſmoothed, warm it by " the fire, then lay upon it, thus warmed, a covering of varniſh, with a reaſon" able large and very fine pencil.

" When you would colour, add to the varniſh about a ſeventh part as much " colour as varniſh, very finely ground; mingle them very well together with a " muller, or ſmooth ſtone cemented to the end of a ſtick: then lay on four co" verings of this mixture, drying it by the fire each time you lay it on.

" If any bubbles ariſe, or the wood be unevenly painted, rub it ſmooth with dried preſle, i. e. the herb horſe-tail.

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[b] Gasper Shottus, a jeſuit, profeſſor of mathematics at Wurtzburg in Franconia.

[c] Regiſter-book, vol. i. p. 104.

" Then lay on four or five couches more after the ſame manner, which is uſually ſufficient for the colouring.

" When the laſt couch is well dried, rub it ſmooth with a linen cloth, or a piece of felt moiſtened with a few drops of ſallad-oil, and then dipped in fine powder of tripoli.

" Then lay on two coverings more of the ſimple varniſh, poliſhing, when it is dry, with oil and tripoli, as before; and laſt of all, rub it with a dry cloth, preſſe, or felt.

RED.

" Spaniſh vermilion finely powdered, q. v. Venetian lacca, a third or fourth part, well mixed.

BLACK.

" Lamp-black, ground with green vitriol.

BLUE.

" Ultramarine; adding only twice as much varniſh as colour.

JAPAN-COLOUR.

" Powder of avanturine: but firſt lay on one covering of varniſh, then four coverings of varniſh and colour mixed; then plane it with preſſe, tripoli, and oil: then lay on two couches more of varniſh, and before the laſt is dry, ſift on the powder of avanturine; give it fifteen or thirty couches more of varniſh; plane it with a pumice dipped in oil, then with oil and tripoli, and laſtly with a dry cloth.

" N. Green takes no varniſh.

GILDING.

" White-lead, umbre, and yellow ochre, part. æq. grind them well together, with as much oil as will render the compoſt reaſonably thin; boil them gently almoſt a quarter of an hour; then lay it on with a pencil, and when it is dry, take up the gold with a little cotton, wet with your tongue, and ſo lay it on."

Mr. Clayton promiſed to communicate to the next meeting his account of Indian varniſh.

Mr. Boyle was deſired to give what he knew relating to varniſh: And

Mr. Oldenburg to write about the account of making ſteel and lattin plates.

Dr. Goddard read his obſervations of the chamelion; which were ordered to regiſtered [d].

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[d] Vol. i. p. 106. They are printed in the Philoſoph. Tranſact. vol. xi. nº 137. p. 930.

Mr. Rooke was deſired to procure two pendulums, one with checks, and the other without: And

Mr. Croune to write to Dr. Power, that he repeat the experiment of the weather-glaſs and mercury at Hallifax-hill.

It was ordered, that in the ſolutions of ſalts, it be obſerved, whether the water increaſe in bulk or not: And

That a bullet be made of quickſilver againſt the next opportunity.

Mr. Croune made his experiment of the preſſure of quickſilver on his thumb.

He was requeſted to draw up a ſcheme of his experiment of bladders.

It was ordered, that a trial be made, whether the ſtone brought in by the amanuenſis, increaſed in weight, as it was repreſented.

November 6. Mr. Croune read his *Experimental account of the raiſing up of a weight hung at the bottom of an empty bladder*; which was ordered to be regiſtered[e].

Mr. Evelyn promiſed to examine the circular rings of trees.

November 13. Dr. Wilkins read a Latin relation of a maid in Holland, who voided ſeed by urine, which being ſown grew.

Dr. Goddard communicated an account of the experiments of a ſtone, called *Oculus Mundi*, brought in by the amanuenſis; which account was ordered to be regiſtered[f], and was afterwards printed by Dr. Sprat[g]. The ſtone was found heavier when tranſparent than when cloudy.

The doctor was deſired to try more experiments upon it.

The amanuenſis caſt a bullet of coagulated quickſilver.

Dr. Wilkins was deſired to bring in writing his relation of a natural ſtandard.

Dr. Goddard was appointed of the committee to examine the ſolution of ſalts, and to obſerve the figures of their criſtalliſations.

Mr. Oldenburg brought in an anſwer to Dr. Goddard's queries concerning the liquor alkaheſt of animals.

Theodore Haak, eſq; was propoſed a candidate by the lord viſcount Brouncker, James Long, eſq; by Mr. Balle, and John Hoskyns, eſq; by Dr. Wilkins.

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[e] Regiſter-book, vol. i. p. 109. It was afterwards tranſlated into Latin, and regiſtered, vol. viii. p. 177.

[f] Regiſter-book, vol. i. p. 132.

[g] Hiſtory of the Royal Society, p. 230.

Mr. Packer and Dr. Willis were admitted into the ſociety.

It was ordered, that the names of thoſe, who propoſe candidates, be for the future ſpecified.

November 20. Dr. Wilkins ſhewed the ſociety the draughts of ſeveral inſects, and read a letter from Francis Willughby, eſq; concerning their hiſtory: which letter was ordered to be copied.

Mr. Willughby was propoſed as a candidate by Dr. Wilkins; and Monſieur Le Febure by Sir Robert Moray.

Dr. Wilkins read his paper concerning a natural ſtandard; ſix copies of which were ordered to be tranſcribed.

Dr. Goddard was deſired to make the experiment of vapours to be turned into air.

Mr. De Serviere's paper of rareties was ordered to be copied.

Mr. Clayton brought in the following account of china varniſh; which was ordered to be regiſtered [h].

" Take a choppin of ſpirit of wine, gum lac four ounces, ſandarac one ounce: put them all in a matras-glaſs very well ſtopt, and the drugs being very well picked, ſet in a B. M. the ſpace of three days; then ſtrain it through a fine linen-cloth, and keep it very cloſe ſtopt.

" *N. B.* The ſpirit of wine muſt be the higheſt rectified. It will do better in a bolt-head ſealed up hermetically. The reddeſt and cleareſt gums are the beſt.

" *The way to lay on the varniſh.*

" Firſt warm the wood by the fire, and lay on one covering of varniſh with a big pencil. When you colour, take ſeven times as much varniſh as colour, and mingle them well together; then lay on four coverings of the mixt colour, and dry it at the fire, whilſt you may tell forty between every covering. If you go too near the fire, it will bliſter. Then with your finger put them down; then give it four coverings more; after rub it over with ſallad oil and tripoli with a linen-cloth. Then lay on two coverings more of pure varniſh, and rub it with ſal'ad oil and tripoli: laſtly, rub it with a fine linen-cloth: the more you rub it the better.

" *To make the beſt Red.*

" Take vermilion of Spain, with a third part of lac de Veniſe."

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[h] Regiſter-book, vol. i. p. 112.

November 27. Sir William Petty delivered in the following hiſtory of clothing; which was ordered to be regiſtered[1].

Of making cloth with ſheeps wool.

1. “ The hair of the ſheep (which we call wool, omitting other cauſes of difference) is different by reaſon of and according to the ſeveral parts of the ſheep, whereupon it groweth.

“ The fineſt (that is the ſmalleſt and ſmootheſt pile) grows on the pole; the coarſeſt about the tail; the ſhorteſt on the head, and on ſome part of the belly; the longeſt on the flanks: the parts alſo of the ſame pile are different, the ends or nibs being more briſtly than the ground.

2. “ Wool is likewiſe naturally of ſeveral colours between white and black. Wool is either ſhorn, and ſo taken off in a whole fleece, or pulled off from the ſkin after the ſheep is dead: this latter ſort is commonly ſhort and finer; if it be ſhort, it is not uſed in cloth, unleſs mixed in fleeces, but rather in hats.

3. “ The firſt operation upon wool is to ſort it; that is, to divide the whole fleece into its ſeveral ſpecies according to its fineneſs, to cut the tarry parts, as alſo the nibs of coarſe briſtly ends.

4. “ Being ſorted, it is waſhed, if coarſe, in ordinary water; if finer, in ſoap: then it is dyed in caſe you make medlies, otherwiſe it is wrought white into cloth, and the cloth dyed afterwards: for ſome colours make the wool more harſh and ſcabrous, and ſometimes more rotten, ſometimes leſs apt to be carded and ſpun, according to the nature of the ſtuff wherewith it is dyed.

5. “ Cloth is either died in cloth or in the wool, the wool of medlies being a mixture of ſeveral colours, tempered as painters do their colours, ſo as to ſample any pattern propounded: and ſometimes cloth, or rather ſtuff, is made into a certain colour by weaving thereinto yarn or threads of ſeveral colours, as was ſaid before of wool.

6. “ When wool is mixed in locks, the next work is to bring the ſeveral hairs of it (which are indeed threads of themſelves) to lie parallel to each other, in order to ſpinning, and to take them out of their natural curls, plexures, and contortuplications. The firſt help hereunto is oiling or ſayving of the wool, ſo as every hair being thereby made ſlippery, may change its ſide and poſition, as aforeſaid, without ſo much force and pulling, as would break the ſtaple.

7. “ There is a juſt proportion of oil, leſt on the one ſide the wool break in in the carding or combing, as aforeſaid; or on the other ſide, it being unfit for ſpinning, as being too ſlippery to keep the twiſt, which the wheel gives it. The

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[1] Vol. i. p. 113.

uſe of oil likewiſe is to weaken the natural ſpring in the wool, for by the like art, the ſprings even of ſteel are weakened.

8. “ The wool being thus prepared with oil, is either carded or combed : the latter is performed with heat, whereby the hairs being once ſtretched out and laid parallel, are the leſs apt to curl up again ; for we ſee many things, as ſtaves, boards, *&c.* being bent whilſt they are hot, do retain the ſame poſition wherein they cool.

9. “ That, which is common both to combing and carding (which anſwers alſo to the hatchelling of hemp and flax) is the drawing it through many wire-teeth over and over ; the which do hold it ſo gently, as that the wool is more eaſily drawn ſtrait, than broken by lying acroſs thoſe teeth.

10. “ The inſtruments of carding and combing ſhall be elſewhere deſcribed. The uſe of carding and combing is alſo to break all knits and plexures, and to make the wool of an even conſiſtence every where, which alſo reſolves into laying the fibres parallel, which they call ſtock carding.

“ Wool thus carded is carded over again with ſmaller cards by the ſpinners themſelves, to bring it into long rowls, and fit to be ſpun.

11. “ Spinning is a ſort of connecting parallel bodies (ſuppoſe cylinders) by changing their figures alike, from ſtrait to ſcrews : for all twiſted threads are ſcrews. Now when one thread is thus locked into another, and when the natural ſpring of each is loſt and ſettled in the ſcrew-like figure, then putting or forcing it any other way, *viz.* ſtrait, doth not disjoin them, no more than pulling a ſcrew-pin ſtrait-wiſe out of its nut doth draw it forth. This ſcrewing doth alſo unite diſtant threads, and make ſuch as lie parallel to lie angularly, and to decuſſate upon each other : theſe ſcrewings do cauſe the threads ſo to pinch each other, that any thing interpoſed between the ſcrewed or twiſted threads, is held faſt by them ; and the thing laſt interpoſing being alſo itſelf ſcrewed, pinches and holds faſt other things interpoſed, as aforeſaid, *& ſic deinceps in infinitum.* And this ſeries of continual twiſtings and interpoſings, whether things are joined or faſtened to each other ſingly by, is the very eſſence and *ratio formalis* of ſpinning.

12. “ The uſual inſtruments and tackling for ſpinning is a wheel, a wheel-band, a whuzze, or ſhiver or ſpindle, a quill and carriers, with other ſmall ſubtervenient inſtruments for regulation of each of theſe ; whereof we ſhall ſpeak, when we treat of all the ſeveral ways of ſpinning uſed for ropes of hemp, ſtraw, ſhavings, hair, threads of wool, flax, cotton, throwſtering of ſilk, making of lute-ſtrings, twiſting of crewel ; where we ſhall note, that drawing of wires is another ſpecies of filamentation, and not at all ſpinning.

13. “ Cloth is made of thread or yarn, by joining many of them placed parallel together with another ſingle thread. Now this connexion is made only by alter-

“ ing the figure of the threads ſo joined, though not by ſcrewing them as before,
“ but by alternate crooking them out of one ſtrait line into many ſemi-circles or
“ other curve lines, alternately convex and concave.

14. “ But knitting, as that of ſtockings or quilting, is made by one ſingle thread
“ diſpoſing itſelf into a ſuperficial tela, by aſſuming peculiar figures for that pur-
“ poſe, unto which alſo moſt needle-works and making of nets are to be referred.

15. “ But where many threads, at firſt placed parallel, or joined together by
“ their ends, are bound together by themſelves, and not by one common thread,
“ as in cloth, that operation makes laces, woven ſilk ſtockings, *&c.* of all which
“ in their places.

16. “ As to cloth, the parallel threads above-mentioned are called the *Stamen*, in
“ Engliſh, the warp, or the chain: the multitude of theſe is according to the
“ breadth of the cloth.

17. “ The twiſting of the yarn for a chain, ought to be ſomewhat harder than
“ the woof. The woof is that infinite thread, which (by running over and under,
“ forward and backward, and that too in a very various alternation through the
“ chain) makes the chain into cloth or tela. This woof is more ſlack ſpun, and
“ conſequently, though it have no more wool in it (length for length) than the
“ warp, yet it appears bigger, ſofter, and finer. The warp alſo muſt be of a long
“ ſtapled wool, whereas the woof needs not, for the reaſons, which ſhall hereafter
“ be ſhewn.

18. “ The operation, whereby yarn is brought off the ſpinners quills, and made
“ into ſkains (which is called reeling) and that other operation, whereby from
“ ſkains it is brought into a chain fit to be turned on upon the loom (which is
“ called warping) I omit only at this time.

19. “ Suppoſing we have now a chain of fit and proper wool and ſpinning,
“ both which muſt be different from that of the woof, as aforeſaid, the next buſi-
“ neſs will be, how to ſtiffen this chain, and thereby to ſtrengthen it. For if this
“ chain, conſiſting of above a thouſand, ſometimes of two thouſand parallel threads
“ (as in your broad-cloths) ſhould be very apt to break, and to ſlip out of the har-
“ neſs, it is eaſy to imagine the hindrance which muſt enſue. The ſtiffning there-
“ fore above-mentioned is intended not only to prevent breaking, but alſo in caſe
“ of breaches, by making the yarn (otherwiſe limber) to become as a briſtle, to
“ make it more eaſily put through the harneſs, which is a very complicated ma-
“ chinament made of threads, and is the ſubtileſt tool uſed about weaving.

20. “ Coarſe yarn, ſuch as is uſed in kerſeys, is ſtiffned only by ſteeping the
“ chain in chalk and water for a few hours, and then ſtretching it out to dry in
“ the ſun; in which poſture, by a dextrous twiſting and letting fly the whole chain
“ together, they break out all the groſſer particles of the chalk again, *viz.* ſuch as
“ ſtick to the outſide of the yarn, and are not received between the very fibres of

" the wool. Sarges are ſtiffned with a ſize made of white leather or parchment ſhreds boiled in water.

21. " When the chain is thus ſtiffned, turned on upon the loom, and in weaving, then they take off the ſtiffneſs again gradually between the ſley and the temples in the ſhuttle's way, partly to make the ſhuttle run; but rather this unſtiffning is to make the yarn more flexible, ſo as the threads may accommodate themſelves each to other the better, and ſo be more eaſy to ſlide and be driven cloſe together by the ſtrokes of the ſley and lath, and conſequently require the leſs thickning afterwards in the mill, which is very dangerous, in caſe the cloth be made of ſuch wool, as is ſubject to waſte in the fulling; that is, to ſpend itſelf into flocks: I ſay, in this caſe, the cloth muſt be home drove in the loom, and conſequently always contributing to the ſhutting together of the threads (ſuch as the above-mentioned untwiſting of them is) muſt be uſed.

22. " The chain is untwiſted and made more ſlippery, in order to the ſhuttle's ſwift and eaſy motion, by drawing a bruſh wet in very ſtrong brine over the chalked chain, and by applying black ſoap to the ſized chain.

" This diſcourſe of untwiſting the chain is extralocal, in reference to the order of proceeding, and mentioned here, by reaſon of the affinity of unſtiffning to ſtiffning: but after the ſtiffning of the chain, the next thing to have been ſpoken of ſhould have been, turning it on upon the loom, whereunto we come next, the which becauſe I fear words will not deſcribe, I ſhall not ſpeak to it at large. In brief, the turning on the chain is to lay, ſuppoſe two thouſand threads ſide by ſide, parallel to each other, and in the ſame plain, and wind them in this poſition many turns (without entanglement) about a rowl, which is called the yarn-beam; the which threads being a chain, did lay ſide by ſide like a ſheaf of ſticks or corn-ſtraws.

23. " The next work is to paſs the end of all theſe threads through the harneſs and the ſley, and then to knit them to certain other thrum-ends, which drive themſelves from the cloth-beam, whither theſe threads muſt be ſucceſſively drawn as faſt as by weaving they become cloth; ſo that now we come to the ſley and the harneſs, in which lies the moſt curious enquiry in the whole buſineſs of weaving. I cannot by bare words venture to deſcribe them but by their uſes.

24. " The harneſs is the inſtrument, whereby many threads faſtened into one ſtrait line by their ends, and all lying in one and the ſame plain, are in a moment drawn from each other, ſo as the one half of them alternately ſhall gape and part, and make an angle to the other half, or ſhall thus gape in any order or proportion of threads aſſigned, be the ſame never ſo various; for ſuch variety the weaving of flowered ſtuffs doth require: the beauty of all which works, and of all the difference of wales (which in few two ſtuffs is alike) is due to the harneſs and its appertenances the treadles.

25.

25. “ The ſlay is an inſtrument ſomewhat like two combs joined together by the ends of their teeth, and is made of the outward cortex of canes or reeds placed parallel to each other, in number anſwering to the number of threads of the ſpecies of cloth which is to be woven, and faſtened at each end unto two other ſticks with a waxed thread. The uſe of it is to drive the woof home, after that by the help of the harneſs it is duly placed between the threads of the chain; for by entring between every particular thread of the chain, it is able to do the ſame.

26. “ The next great inſtrument of weaving is the ſhuttle, whereof alſo is great variety: the uſe of it is to throw or dart a limber weak thread in a moment, croſs the whole chain in a direct line. 'Tis made of heavy, hard, ſmooth-grained wood; heavy, for its more ſteady motion; hard, to prevent wearing, which the frequent and tranſverſe affriction it continually endures would ſoon do, as witneſs the ſhoeing of them with ſtrong wire; and ſmooth-grained, to prevent ſplints and its catching on the chain. It hath a hollow belly, to contain the quill of yarn which it carries. It hath two gudgion-holes at each end of this belly, to take in the axis of the quill: at one hole is a ſpring to let in and out this axis; on the other ſide of this belly is a hole ſhod with a ring of wire, to let out the thread from the quill always at the ſame angle, to which purpoſe the quill is too ſhort for the axis whereon it rowls, and moves as ſhuttley upon it as may be; the yarn unwinds ſtill at the ſame angles, *viz.* right angles, that the ſwift motion of the ſhuttle may not in an inſtant, and not gradually, tear off all the yarne from the quill together.

27. “ To which purpoſe there is ſomewhat conſiderable in the winding the yarn upon theſe ſhuttle-quills, which is done, firſt by covering the quill, as if it were woulded like a broken bow, or fiſhed-maſt of a ſhip; then forming two little double cones at each end, which the quilling boys call naps, leaving a kind of circular valley between them; and then by continual and even turning and woulding from one nap to the other, to finiſh up the whole quill into a double cone, or two cones joined by their baſes. This is ſo nice a buſineſs, that the poor boys, who work at it, do often feel the penalties of miſcarriage.

28. “ To this quilling is neceſſary a wheel and band, ſpindle, whur and beards; a quill box with ſloping cheeks, to fit ſeveral ſpindles; a ſwift or tympanum, with a block or ſpindle, whereon it moves horizontally. This ſwift is made of willow-ſticks, cut like the ſails of a windmill, ſet together like the braces-ſtrings of a drum, joined at the head and bottom with ſmooth arms running through diſtinct holes in a block, both at top and bottom. The ingenium of it is, to admit ſkains of yarn of any bigneſs, and keep them to any height, that the ſpindle of the quill ſhall require; for the ſkain muſt lie always ſomewhat lower, ſo as to bind the quill, that it may not unravel or run out all at once, as aforeſaid; and yet not to bind ſo hard as to break in ſhooting, rather than to run out kindly and gradually.

29. " The quiller keeps always one hand upon his thread to direct it upon the
" quill, and alſo to moderate the binding above-mentioned. To do this in a juſt
" proportion very ſwiftly, requires a pretty dexterity.

30. " I have been perhaps too long in deſcribing the minutiæ of very ordinary
" and ſmall operations; but I hope no philoſopher will deſpiſe this, no more than
" he would the anatomy of a mouſe or frog; for as ſmall, and as common, and
" as cheap as theſe are, I do not doubt but the invention of them was very difficult
" and curious at the firſt.

31. " For, 1ſt, to bring curled, complicated, and entangled hairs to lie parallel,
" ſtrait and even, and ſo to remain, notwithſtanding the ſtrength of their natural
" ſpring and reſiliency, which is carding:

" 2dly, To bring a curled knot of any matter into a long even cylinder, which
" is ſpinning:

" 3dly, To bind a thouſand ſeveral threads together with one ſingle thread, ſo
" as to make a tela beautifully variegated in its ſuperficies, which is weaving:

" 4thly, To dart or ſhoot a long, weak, limber thread to a certain diſtant point
" or ſcope, which is the ſhuttle-work of the weaver:

" I ſay, to perform all theſe compounded operations with ſome one ſimple regular
" motion, as that of carding, and ſpinning, and weaving are, is not contemptible,
" nor eaſy for a very inventive wit, without deep and long meditations to excogitate.

" I have hitherto moſt imperfectly deſcribed the making of cloth ſo far as to
" bring it to the loom, having purpoſely omitted the fabric of many an uſeful
" tool, yea, even of the cards, wheels and the loom itſelf.

32. " In the next place we are to proceed to burling, ſcowring, milling, tentering,
" rowing, ſheering, cottoning, and preſſing, and even to the folding and packing
" of the cloth woven as aforeſaid, the chief whereof is milling and ſheering.

33. " After weaving, the next operation is burling, which is no more than picking
" out the knots, which the often breaking of the yarn, both warp and woof,
" doth occaſion in the weaving. The ingenium of this work lieth chiefly in iron,
" wherewith it is performed, reſembling a duck's bill, but much ſharper; the
" two chops whereof are opened by the ſpringineſs of themſelves, joined in an
" angle at one end, but ſhut with the hand of the uſer. This inſtrument catches
" hold of the knot, and having gently raiſed it from the body of the cloth, nips it
" off. The dexterity of this work is in raiſing no more of the knot than needs
" muſt, leaſt by pulling out too much thread the cloth be weakned.

34. " The next work is ſcowering the cloth from the oil, chalk, dying-ſtuff, as
" alſo from the accidental foulneſs got into it in its paſſage through the many hands
" and

" and ſhops aforementioned. And this is performed with fullers earth, and ſome-
" times with urine, and ſwines dung (all or ſome whereof anſwers to ſoap in ordi-
" nary waſhing) and with the beating of the mill, which anſwers to rubbing in the
" ſame ordinary waſhing: for if it be hard labour to waſh ſmall linen, it cannot
" but be thought work for a great engine, and not a man, to ſcower things of ſo
" large dimenſions as pieces of cloth are. Nor would the charge of this ſcowring
" be tolerable, unleſs it could be performed (as it is) with engines inſtead of mens
" labour; and with the natural and cheap abſterſives aforementioned, inſtead of
" artificial ſoaps made with ſtrong lixivia and unctuous matters, either oil or tal-
" low: for, indeed, the beſt Wooburn earth reſembleth Caſtle-ſoap not obſcurely,
" that and all other ſcowring earths conſiſting (as near as I can gueſs) of very fine
" ſand, anſwering to the ſalt in ſoaps, and of a fat matter anſwering to the tallow
" or oil condenſed by coction, which are the ingredients of ſoap. The oily part
" of all theſe abſterſives ſerve to inſinuate the whole between the abſtergendum
" and the ſordes, and to lubricate the motion of the ſordes from the abſtergendum;
" and the ſalt or arenulæ ſerve as ten thouſand little ſcraping knives acted by the
" confrication of one's hands or other engines upon the abſtergendum, wherewith
" to take off the ſords; and, laſtly, the water uſed in all ſcowrings ſerves not only
" to attenuate and diſperſe the abſterſive equally, but alſo to receive the ſordes, and
" by continual giving place to freſh cleaner water, to carry off the whole abſter-
" ſum until itſelf at laſt come off clean, which laſt waſhing is called rinſing, from
" the Dutch word *Rein*. The rarity of theſe abſterſive earths is, that, though they
" be compoſed of innumerable little ſands, yet have they no great ones, much leſs
" ſtones, which is the bane of earth otherwiſe good enough. Now it is eaſy to
" conceive, how pernicious it would be to a cloth, if but one ſmall ſharp ſtone were
" thrown into the fulling ſtock or alveus, wherein the cloth is violently beaten, as
" it lays in folds; for although one ſtroke of the mill might ſtrike a hole, not above
" three or four leaves thick at a time, yet by repeating the ſame miſchief perhaps
" near a thouſand times in an hour, the cloth may, in as many hours as are required
" to this work, probably be beaten all to pieces.

35. " Having thus touched the ingredients of ſcowring, we ſhould now deſcribe
" the mills; the peculiar ingenium whereof lies only in this, that the head or ham-
" mer is ſo fitted in its figure to the ſtock, box, or alveus wherein the cloth lies,
" that though it ſtrike maſſy blows, yet it doth not tear the cloth; but turns it
" over gradually and equally at every ſtroke a little, which figuration deſerves a
" large deſcription. The main ingenium of the work is, to place the cloth hand-
" ſomely in the mill, for the purpoſes above-mentioned, and to put in the ingre-
" dients from time to time, as the work requires it.

36. " Having ſcowred the cloth (which may be done leiſurely, and without
" ſuch violence as heats it much) we now come to fulling, which is a motion of
" the ſame nature with that of ſcowring, but much more vehement, ſteady, and
" continued: the mill-ſtock being wrapt up warm, that the cloth may not cool,
" until the whole work be finiſhed. This work muſt be carefully attended by a
" perſon able to remedy the accidents, of not proving, that is, not ſhrinking; waſt-
" ing, that is, when the ſubſtance of the cloth works off into flocks, or elſe tearing.

" Which is done partly by moderating the heat and motion of the mill, mending the poſition of the cloth into the ſtocks, and by throwing in oatmeal, earth, and ſig (that is ſtale urine) *&c.* at convenient times, of which, as we digreſſed to give our conjecture of the nature of abſterſion, ſo now we ſhall do the like of fulling.

37. " Fulling therefore is making the cloth to become thicker with the diminution of its other dimenſions, and the covering of its threads ſo, as the cloth ſhall ſeem to be tranſlated from the likeneſs of a tela (all whoſe threads appear) to that of a hat, which have no threads at all; for, by the way, the making of a hat is the making of a tela, without ſpinning or weaving, by a kind of fulling not unlike this we now ſpeak of, in the ratio formalis of it.

" This thickning is made by the ſhortning of the threads; this ſhortning of the threads by the twiſting of them; this twiſting by the heat of the mill (for ſuch effect viſibly hath heat on hairs, *&c.* ſome of which is wool); this heat of the mill is excited rather by an equal motion than by fire and ſcalding water, as in hats; and the conſtriction is furthered by oatmeal, earth, and urine, which are leſs potent than the aſtringent powders and liquors uſed about hats.

" By the twiſting and beating aforementioned (as in making of feathers it is viſible) ſome piles cleave, ſwell, and riſe; thoſe piles riſing numerouſly out of all parts of the yarn, catch hold of each other, and twiſting themſelves together likewiſe do draw the threads, out of which they ſprang, cloſer to each other. Finally, all this heat doth intenerate and make glutinous the piles of the wool (as appears in working of hornes and making glue of ſkins) ſo as they cling to each other. Now theſe piles, binding themſelves by a double way of connection, *viz.* this and that of twiſting (either whereof might ſerve) they become good cloth, whoſe excellency it is to be like a felt or parchment, that is uniformly cloſe and denſe in all its parts.

38. " When the cloth is taken out of the mill, the holes happening in that work are drawn up, that is, ſewed up by a peculiar kind of ſtitch, which, although it be moſt ſtrong, doth not at all diſcover the thread, wherewith it is made, nor the holes, where the needle goeth in and out, nor any puckring, whereby either may be diſcerned: but of this, when we handle the great variety of ſtitches and ſeams in all the uſual and uſeful ſorts of needle-works.

39. " The next work is racking or tentering the cloth, which is no more than making the cloth (which becomes uneven in the milling) to be all of one breadth, ſtrait and ſmooth; and this is performed by ſetting it in a frame, which we call tenters, ſuch as are to be ſeen in many fields about London, wherein (it having a windleſs at one end) it is firſt ſtrained to its length, then afterwards to its breadth and paralleliſm, by ſetting the lower chap of the tenter (whereunto the liſts of the cloth are hooked, as well as to the immoveable part above with tenter-hooks ſet all along a cloth about two inches diſtance) higher or lower, there being pins and holes to faſten the ſaid lower chap any where.

“ Now this work is done in a warm ſun-ſhiney day, that by the heat and time of “ the cloth's detention in the tenters, the deſired ends above-mentioned, and of “ fixing the cloth to its dimenſions, may be obtained. Where note alſo, that “ while the cloth is thus in the tenters, they lay the wool of it all one way, by “ running it over ſeveral times with ſhort briſtled buſhes fixed under the palms of “ their hands.

40. “ Having taken it out of the tenters, they rough it, that is, raiſe the wool “ of it, or make all the little hairs beaten up in the milling to ſtand an end, ſo as “ the extravagancies and inequalities of them may be corrected by the ſucceeding “ ſheers. And this they do by doubling the cloth over a perch, placed horizontally “ over the head of the workman; and then placing their hand on one ſide of “ the cloth, and their handle on the other, they do (moving hand and handle together, “ from the top to the bottom of the workman's reach) ſcratch up the “ woolly exfilaments of the cloth, as aforeſaid. Now the handle, laſt above-mentioned, “ is an inſtrument made of above twenty teazils (or burs of labrum veneris, “ each of which carries a thouſand hamuli) bound into a frame of willow-“ wood with a double twine thread, and is cleared from the flocks, which it gathers, “ with another inſtrument called a preem, which is nothing but about forty “ long wire-needles, crooked and ſet into an handſome frame of wood.

41. “ The wool being thus univerſally raiſed and ſet on ends, the next, even “ that great and ſubtil work of ſheering follows, unto which the deſcription of the “ ſheers, with their weights, bolſters, querrets, hooks and collars, as alſo of the “ ſheering-board, is neceſſary, or at leaſt convenient.

“ Theſe ſheers have this common with all other ſheers and ſciſſars, that they “ have two edges decuſſating each other, which edges are not in the ſame but in “ ſeveral plains, and the point of decuſſation changing or running from end to end “ of the edges in a moment, or in a very ſmall ſpace of time.

“ They have another thing in common with ſome other ſheers, which is, that “ their edges cloſe with the ſtrength of the ſheer-man's hand, but open by the “ ſpringineſs of the circular bow, which joins both edges or chaps of the ſheers “ together.

“ They differ from moſt ſheers and ſciſſars, that the two chaps are not joined to “ each other in their decuſſation with a central pin on which they turn, the chaps “ in ſuch being both opened and ſhut by the ſtrength of the workman's hand.

“ Laſtly, they differ from all other ſheers, in that one of the chaps, *viz.* the “ lower, is moved by one ſingle progreſſive motion along the working board, the “ other moving alſo with the ſame, but making numerous alternate reſilencies to “ and from the ſaid under chap in its way; the whole ſheer is moved forwards, as “ aforeſaid, with the right hand and left thigh of the workman, whilſt the upper “ chap plays upon the lower in the alternate reſilencies aforementioned, by the “ ſtrength of the left-hand wriſt and the vola of the right. Now the ſaid left-

" hand wriſt moves upon the fingers of the ſame hand as upon a center, the ſame palm " graſping and moving the querret, which moves alſo upon the outward ſide or back " of the ſheer's upper chap, as on its center: where note, that the lower chap is kept " cloſe down to the ſheering-board with weights of lead; and the upper chap is " made to preſs more or leſs cloſely upon the lower (whereby to cut a deeper or ſhallower kerſe) with the help of cuſhions or bolſters made of folded cards, thruſt under the wooden-ſtock, whereunto the wriſt-collar, above-mentioned, is faſtened. " So that, if the weights be multiplied upon the lower chap, and the cuſhions be but " thin, then the ſheer works rank, that is, takes off a deep flock; the contrary, if " one or both theſe cauſes be removed.

42. " The curioſity of making theſe ſheers lies in the bow and in the twiſt of " the ſhank, to make the upper chap ſtrike true upon the lower; as alſo in grinding the edges into very ſtrait lines; and, to be ſhort, in ſo fitting the chaps one " to another, as no light may be ſeen between the edges, though held up before it. " Which work is ſo ſubtile, that a ſmall touch of a hammer, ſtruck in one place, " makes the chaps cloſe duely, perhaps ſeven or eight inches off. Moreover, ſo " few men can ſet and grind a ſheer exactly (and yet it is done ſo eaſily by him, who " hath the ſlight) that one man at appointed times perambulates a whole county for " this purpoſe.

" To conclude this matter of ſheering, I ſay, that the art of driving the ſheer " (whereby the nap of the fineſt cloth is cut ſo ſhort, cloſe, and even in all places) " is ſo nice, that the ſight itſelf cannot ſcarce apprehend it, much leſs can words " deſcribe it; for it is only the touch of the workman's hand, that can underſtand it.

" The cloth in its ſheering is ſucceſſively drawn over that, which they call a board, " which indeed is rather a cuſhion (whoſe back is a board) ſtuffed very hard and " even with wool, the belly being made of fine ſack-cloth, and covered again with " woollen cloth. The deſiderata of the board are, to be even, evenly convex, and " to have a gentle ceſſion and reſilency in it.

43. " They uſe alſo a kind of an ointment upon the cloth and upon the edges " of the ſheers, before they cut, which ſerves (as I ſuppoſe) to facilitate the ſheers " ſliding over the cloth, and to ſoften the nap of the wool, ſo as it may be ſhorn " off more eaſily; as barbers uſe ſoap and warm water for the more eaſy ſhaving " of the beard.

" After the cloth is once ſhorn, it is roughed again, and ſhorn again, even to " the third time, or until the whole ground be fully raiſed, that is, until the nap be " as thick as it may be, and then ſhorn down to all poſſible politeneſs.

44. " When the cloth is thus ſhorn on one ſide, it is for the moſt part cottoned " on the other ſide, which they call the wrong ſide; but frizes are cottoned on the " right ſide, for cottoning makes them ſuch. Now cottoning is the ſame as the " nap of the wool, which conſiſts of innumerable extant villi or pili, as if one

" ſhould take the tops of five hundred ſtalks of corn in a ſtanding corn field, and " tie them together; afterwards twiſting them round, until they become faſt without tying, and ſo proceed throughout the whole field, turning all the ſaid field " into little cones.

" Now the ingenium of cottening is, how, with a few twirls of the hand, ſuddenly " to raiſe a thouſand of theſe little cones out of the nap of the cloth, and ſo to " change the whole face and appearance of it, and in ſome meaſure the colour itſelf: " For every cone caſting a ſhadow makes the ſuperficies of the cloth appear " more blackiſh and ſad than before. Where, by the way, I offer, whether galls " (ſuppoſing all aſtringents work by twiſting and curling, as before I ſhewed) do " not twiſt the aculeate particles of diſſolved copperas, making of themſelves no " colour, into numerous cones, and thereby produce a black colour; the pro- " priety of cones, and pyramids, and other acuminate bodies, being to return " none of the light they receive, which is the ſame, as to cauſe inconſpicuity or " blackneſs.

45. " Now the ſudden making theſe cones out of the nap of a cloth is as fol- " loweth: They take a thin board, about ſixteen inches long and twelve broad, " and incruſtate one ſide of it to the thickneſs of an half crown with a compoſition " of ſand, roſin, and wax; to the other ſide of this board they faſten two handles " perpendicularly.

" The cloth to be cottoned is made a little clammy, with an ointment made " with honey, and roſin, and ſtrong wort. The cloth and tool being thus pre- " pared, they ſet the above-mentioned cottoning-board on the cloth, and then " move it like a ſieve you clean corn with. By this motion and affriction, the " cruſtamentum of the board becomes warm and adheſive, whereby it catches " hold of the villi of the nap, being made clammy as aforeſaid; and by its " twirling motion twiſts them into cones.

" Cloth being thus dreſſed, is folded up after a peculiar manner into leaves, " between each of which ſkins of hard vellum being laid, it is put into a ſcrew- " preſs, where, by remaining ſome time, it gets a gloſs."

The amanuenſis was ordered to provide ſerpents, that will burn under water, againſt the next meeting.

Sir **WILLIAM PETTY** read his propoſitions concerning ſhipping.

An experiment being made to turn water into air in a bladder, the bladder failed, becauſe the water was too hot.

Dr. **GODDARD** brought in an additional account of the ſtone called *Oculus mundi*; which was ordered to be regiſtered, together with that given in on the 13th of November.

A copy of Dr. WREN's hypotheſis of Saturn was directed to be made, in order to be ſent to Monſ. HUYGENS.

Decemb. 4. Sir ROBERT MORAY was deſired to bring in his engine for hearing, at the next meeting.

Sir WILLIAM PETTY promiſed to ſpeak with the lord viſcount BROUNCKER, concerning his account of ſhipping, and to communicate an account of it to the next meeting.

Dr. GODDARD tried a tranſparent ſtone, as the *Oculus mundi*; but no conſiderable alteration was made in it, when ſteeped in water.

Mr. ELLISE ſubſcribed his name.

Mr. LONG, Mr. HOSKYNS, Mr. HAAK, Mr. WILLUGHBY, and Mr. LE FEBURE, were admitted into the ſociety.

JOHN BROOKE, eſq; was propoſed as a candidate by Sir WILLIAM PETTY and Mr. BALLE.

Mr. POWLE promiſed to bring in an account of iron, from the ore to the bar.

Mr. CROUNE was deſired to inquire into the manufacture of hats.

Mr. ELLISE promiſed to inquire into the making of lead.

The amanuenſis was ordered to bring in a glaſs-hatband at the next meeting.

Mr. ELLISE and Mr. POWLE were requeſted to try the quickſilver experiment in the deepeſt pit, which they can meet with:

Mr. ELLISE to try likewiſe, whether the weight of any thing differs at the bottom of a pit, from what it does at the top:

Mr. BOYLE to bring in his obſervations of the quickſilver experiment: And

Mr. BALLE to communicate his account of the ſame.

Mr. CROUNE read a Latin letter from Monſ. DE MONTMORT, preſident of the academy at Paris, to Sir ROBERT MORAY.

The amanuenſis produced artificial ſerpents, which being fired, and caſt into the water, burnt there till they bounced.

Decemb. 11. Mr. POWLE promiſed to communicate a deſcription of the place mentioned by him, as having a remarkable echo.

Dr. GODDARD was deſired to continue the experiment of ſteeping the ſtones in water.

Mr. LE FEBURE, Mr. HAAK, and Mr. HOSKYNS, ſubſcribed their names.

Sir ROBERT PASTON, bart. was propoſed as a candidate by Dr. HENSHAW.

The Muſcovia powder, formerly brought in by Mr. PALMER, was mentioned to be called Playon.

Upon a report made, that Mr. EVELYN, one of the members of the ſociety, had done honour to it, in an excellent *Panegyric on his majeſty King* CHARLES II. *at his coronation* [k]; and ſince that, in an Epiſtle Dedicatory, addreſſed to the lord chancellor; in which, with great eloquence, and high expreſſions of eſteem, he mentioned the ſociety and its deſign, and moſt affectionately recommended it to his majeſty and his lordſhip; the ſociety were ſo ſenſible of the great favour done them by this worthy perſon, that they ordered their thanks to be given him; and in order to make theſe thanks the more ſolemn, appointed them to be entered into their journal-book.

Decemb. 18. Dr. WILKINS was deſired to produce, as ſoon as his conveniency would permit him, his experiment of hearing, which he promiſed: And

Mr. BOYLE to try the velocity of ſounds.

Dr. SETH WARD, lord biſhop of Exeter, ſubſcribed his name.

Sir ROBERT PASTON was admitted into the ſociety.

JOHN WINTHROP, eſq; was propoſed as a candidate by Mr. BRERETON.

A bolt-head, with a long and ſmall neck, being filled to eight inches higher than the boul, and then nipt up and put into a ſkellet of water a little warmed, the water in the neck of the bolt-head aſcended ten inches, and left thirteen with compreſſed air above; but it was not tried farther, leſt the glaſs ſhould burſt.

Dr. CLARKE was deſired to bring in his account of his late diſſection of a dog.

It was ordered, that the ſociety's meeting be adjourned to that day fortnight, on account of the feſtival of Chriſtmas; and that the experiment of hearing be provided for that meeting.

Mr. BALLE brought in his account of the quickſilver experiment made at Mainhead; which was ordered to be regiſtered [l].

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[k] Publiſhed at London in April, 1661. in folio.

[l] Regiſter-book, vol. i p. 134.

$166\frac{4}{5}$. *January* 1. Mr. Colwall introduced to the ſociety a captain of an Eaſt-India ſhip, who offered to obſerve ſuch inquiries, as they ſhould propoſe to him.

Mr. Croune was deſired to write to Dr. Power, to obſerve the weather at Hallifax:

Dr. Wren to draw up a ſcheme for a weather-cock, againſt the next meeting: And

Mr. Powle to obſerve the weather at home, and to give account thereof at his conveniency.

Four or five copies of the inquiries for foreign parts were ordered to be made and given to Mr. Povey.

Mr. Oldenburg read a paper concerning a new manner of cutting the ſtone out of a man's bladder.

Mr. Robert Paston ſubſcribed his name.

Mr. Winthrop was admitted into the ſociety.

Dr. Wren was requeſted to proſecute his deſign of trying, by ſeveral round paſteboards, their velocity in falling.

Dr. Wilkins produced his engine for hearing.

Mr. Le Febure ſhewed the ſociety a piece of mineral ſulphur, as clear and white as cryſtal.

Jan. 8. Sir Robert Moray communicated letters, in French, from Monſ. Frenicle to Monſ. Huygens, concerning the hypotheſis of Saturn; which were ordered to be tranſlated into Engliſh.

Mr. Rooke read a paper of inquiries to be made in the Eaſt-India captain's voyage to Bantam.

The method of ſounding the depth of the ſea was diſcourſed of.

Dr. Wren brought in a ſcheme of a weather-clock.

It was ordered, that all the papers of inquiries for foreign parts be written out into one paper.

Mr. Henshaw read a paper of propoſals for freezing of water in a glaſs globe with a ſhort neck.

Mr. **Brooke** was admitted into the ſociety.

Mr. **Evelyn** read an *Account of the making of marbled paper*; which was ordered to be regiſtered [m].

Jan. 15. Two copies of the inquiries for the Eaſt-Indies were ordered to be made againſt the next meeting.

Dr. **Wren**, Mr. **Balle**, and Mr. **Rooke**, were deſired to conſider thoſe obſervations, that were ſent by the earl of **Sandwich**.

Prince **Rupert** ſent the ſociety a deſcription, in High Dutch, of the method of making good gun-powder; which Mr. **Oldenburg** was deſired to tranſlate, and Sir **Robert Moray** to return their thanks to his highneſs.

Mr **Croune** read an account of the weight of a live carp, in and out of the water; and of its weight when dead; which account was ordered to be regiſtered [n], and is as follows:

" The weight of the carp alive in the air was 2 ℔ 1 ℈.

" The fiſh tied to one end of the ſcale-beam was ſo light in water, that the ſcale
" at the other end raiſed her: therefore was faſtened to her a weight of 8 ℥; the
" whole weighed 7½ ℥ ½ ℈. The weight of the ½ ℔ in water *per ſe* 7 ℥. So the
" carp weighed alive in water ½ ℥ ½ ℈; and loſt of its weight in the air 1 ℔
" 15½ ℥ ½ ℈. But the 8 ℔ weight loſt of its weight in air but 1 ℥.

" The carp was opened to take out the ſwim; but before it was taken out,
" ſhe was laid in the water on her ſide (the belly open, and the ſpawn, &c. in)
" which poſture ſhe kept, and remained on the ſurface of the water.

" Then the ſwim, ſpawn, &c. being taken out, ſhe was again put into water;
" the belly folded up cloſe, ſhe ſwam; till beginning to move, the belly took in
" water, and ſunk her to the bottom.

" The ſwim bore up a weight (weighed in water) of 2 ℥ 1 ℈. The fiſh dead,
" without ſpawn, &c. weight in air 6 ℥ 5 ʒ 2 ℈. Dead (as before) in water 2 ℥ 1 ℈.

" The ſwim tied to it bore it up.

" The heart taken out and cut into many pieces, every piece contracted and
" dilated itſelf almoſt ¼ of an hour.

" After all, that is above mentioned, was done about an hour, the fiſh being touched under the gills, gave a ſtrong leap up.

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[m] Regiſter-book, vol. i. p. 137. [n] Ibid. p. 141.

“ About two hours after, ſhe had a ſtrong tremulous motion of the gills and “ mouth.

“ The bladders and the ſwim are perforated into each other.

In a roach,

“ Almoſt the ſame things were obſerved; it weighed, in air, 7℥ 7ʒ 1℈; in “ water, 1ʒ 2℈: the ſwim bore up, 5ʒ.

“ A ℈ weight of braſs laid on the dead roach ſunk him to the bottom; half a ℈ “ would not do it. Quær. Whether this be not to be allowed to the air in the “ pores, blood, cavities of the ventricle, &c.”

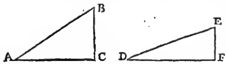
January 22. The experiment of making marbled paper was made by a man introduced by the amanuenſis; which ſucceeded, according to Mr. Evelyn's deſcription of that method.

Sir William Persall entertained the ſociety with ſome magnetical experiments.

The pendulum experiment was diſcourſed of by the lord viſcount Brouncker, who brought in the account and ſchemes of it; and a committee was appointed for making trials of it, conſiſting of his lordſhip himſelf, Mr. Boyle, Sir William Petty, Dr. Wilkins, and Dr. Wren.

His lordſhip's paper was ordered to be regiſtered *, and a copy of it made againſt the Friday following, and brought to Sir Robert Moray, to be ſent to Monſ. Huygens. The paper was as follows:

“ Imagine the curve H X C to be made up of an infinite number of equal “ ſides or ſtrait lines (as H *b*, *b d*, *d f*, &c.) ſo inclining, that their perpendicu- “ lar altitudes (*a b*, *e d*, *e f*, &c.) are in an arithmetical progreſſion from an ho- “ rizontal to a vertical poſition. I ſay, firſt, a bullet moving in ſuch a curve, “ falls from all parts thereof in equal time, as from *f* to H, *b* to H, *d* to H, “ X to H, *&c.* all in the ſame time; which I ſhall demonſtrate preſently. But “ firſt I muſt aſk, that it be granted me, that the increaſe of the velocity of the ſame “ body deſcending is always in proportion to the power of the weight. As, that “ becauſe the powers of the weight are in proportion to the perpendicular alti- “ tudes of the inclinations of the planes, as you may ſee in Stevinus, *Livre* I. “ *de la Statique*, prop. xix. cor. 2. “ therefore, A B and D E being “ of the ſame length, and E F to “ B C as 1 to *a*, the increaſe of “ the velocity of a bullet in de- “ ſcending B A is to the increaſe of



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* Regiſter-book, vol. i. p. 157.

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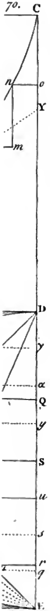
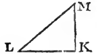
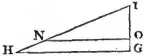


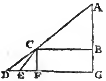
NAZIONALE VITTORIO EMANUELE III NAPOLI

" of the velocity of the ſame bullet in deſcending E D as a to 1; and conſequently, that the time it deſcends E D, is to the time it deſcends B A, as $\surd a$ to 1. For if the increaſe of the velocity upon B A be to the increaſe of the velocity E D, as a to 1, or as G H to K L (I G and M K being equal, as repreſenting the ſame ſpace of time;) then drawing N O parallel to the baſe, ſo as the triangle N O I be equal to the triangle L K M, that the triangle L K M repreſenting the ſide D E, N O I may repreſent the ſide A B; and therefore, the time of the bullet's deſcent upon A B, to the time of its deſcent upon D E, as I O to I G; but becauſe H G is to L K, as a to 1; therefore the triangle H G I is to the triangle N O I (= L K M, as a to 1. And becauſe the triangle H G I is to the triangle N O I, as the ſquare of the ſide G I to the ſquare of the ſide O I; therefore the ſquare of G I is to the ſquare of O I, as a to 1. Therefore G I is to O I, as $r\,a$ to 1, or as 1 $r\frac{1}{a}$.





" Now becauſe X 1 is to $b\,a$, as X H is to B H, that is, putting x for the number of the ſides, as x to 1, therefore the time of its deſcent from X to b, being let fall at X, is to the time of the deſcent from b to H, being let fall at b, as $r\frac{1}{x}$ to 1. And becauſe X 1 . bg : : X H . b H (that is) : : x . $x-1$.

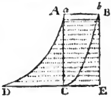


" Therefore A B C repreſenting the ſpace or ſide X b, and A B the proportionable time the bullet is deſcending that ſide, found (as before) to be $r\frac{1}{x}$; let a be put for B G, the time that the ſaid bullet, being let fall at X, is paſſing from b to f; and let y be put for B C, the velocity, that the bullet hath acquired at b in its deſcent from X. Then becauſe A B, C F, B C, F D, that is, $r\frac{1}{x}$. a : : y . $ayrx$. therefore D F $= ayrx$; and becauſe X i. bg : : D F. F E (by the poſition above mentioned, that the increaſe of the velocity is in proportion to the power of the weight; or, which is the ſame thing, to the perpendicular altitude of the inclination of the ſide) that is, x. $x-1$: : $ayrx$. $\frac{x-1}{x}ayrx$; therefore $\frac{x-1}{x}ayrx =$ F E; therefore the triangle C F E $= \frac{x-1}{2x}a^2yrx$, and the parallelogram F C B G $= ay$, and the triangle C B A $= \frac{y}{2rx}$. But E C B G $=$ C B A, (becauſe $bf =$ X b) therefore $\frac{x-1}{2x}a^2yrx + ay = \frac{y}{2rx}$. therefore $\underline{x-1}\,a^2y + 2ayrx = y$; therefore $\underline{x-1}\,a^2 + 2arx = 1$; therefore $a^2 + \frac{2rx}{x-1}a = \frac{1}{x-1}$; therefore $a = \frac{r:2x-1:-rx}{x-1}$, which therefore is the time, that the bullet, falling from X, deſcends the ſide bf. In the ſame manner,

" the time the bullet deſcends the third ſide, is found to be $\frac{r:3x-3:-r:2x-1}{x-2}$:
" and univerſally the times are $\frac{r:\overline{l+1}\,x-\frac{l^2+l}{2}:-r:lx-\frac{l^2-l}{2}}{x-l}$, l being put for
" the number of ſides deſcended. Now the aggregate of all theſe times are
" $r:\frac{x^2+x}{2}$; abating this ſeries $\frac{1}{s^2+s}r:\frac{x^2+x}{2}-\frac{s^2+s}{2}$; s being put for 1, 2, 3,
" 4, &c. until it equals x, as is evident by induction: thus,
" If $x=1$, the time is $r\frac{1}{1}$ - - - $=r1$.
" If $x=2$, the times are $r\frac{2}{2}+\frac{r3-r2}{1}$ $=r3-\frac{1}{2}r2$.
" If $x=3$, the times are $r\frac{3}{3}+\frac{r5-r3}{2}$
$+\frac{r6-r5}{1}$ - - - - - - - - $=r6-\frac{1}{2}r5-\frac{1}{6}r3$.
" If $x=4$, the times are $r\frac{4}{4}+\frac{r7-r4}{3}$
$+\frac{r9-r7}{2}+\frac{r10-r9}{1}$ - - - - $=r10-\frac{1}{2}r9-\frac{1}{6}r7-\frac{1}{12}r4$.
" If $x=5$, the times are $r\frac{5}{5}+\frac{r9-r5}{4}$
$+\frac{r12-r9}{3}+\frac{r14-r12}{2}+\frac{r15-r14}{1}$ $=r15-\frac{1}{2}r14-\frac{1}{6}r12-\frac{1}{12}r9-\frac{1}{20}r5$.
" &c. &c. &c.

" Then becauſe $\frac{1}{s^2+s}r:\frac{x^2+x}{2}-\frac{s^2+s}{2}$, are the ordinates of an ellipſis, divided " by a ſeries of triangular numbers, therefore A, B, C repreſenting that ellipſis, and A, C, D the ſeries of triangular numbers; and ACEB a parallelogram upon the ſame baſe and altitude with the ellipſis: becauſe the ſeries of ordinates in the parallelogram, divided by the ſeries of triangular numbers reſpectively, equals twice AB (the ſeries being infinite) or $r:\frac{x^2+x}{2}$.

" $ab=\frac{2x+1}{4r2}$
" $AB=\frac{1}{2}r:\frac{x^2+x}{2}$:
" $aA=\frac{1}{2}$.
" $aC=x+\frac{1}{2}$
" $DC=\frac{x^2+x}{2}$.



" For

1)1(1	1)6(6	1)10(10
1)3(3	3)6(2	3)10($3\frac{1}{3}$
3)3(1	6)6(1	6)10($1\frac{2}{3}$
4	9	10)10)1
		16 &c.

" That is
$$1)\frac{x^2+x}{2}\left(\frac{x^2+x}{2}\right.$$
$$3)\frac{x^2+x}{2}\left(\frac{x^2+x}{6}\right.$$
$$6)\frac{x^2+x}{2}\left(\frac{x^2+x}{12}\right., \text{ \&c. or } l=1,\ 2,\ 3,\ 4,\ 5,\ \text{\&c.}$$
$$\frac{l^2+l}{2})\frac{x^2+x}{2}\left(\frac{x^2+x}{l^2+l}\right.$$

" *uſque ad*

$$\frac{x^2+x}{2}\Big)\frac{x^2+x}{2}\Big(\frac{1}{x^2},$$ being the aggregate.

" But becauſe AB, the dividend, is not $\frac{x^2+x}{2}$, but $\frac{1}{2}r:\frac{x^2+x}{2}$; therefore the " aggregate of all the quotients is not x^2, but $r:\frac{x^2+x}{2}$ (equal to twice AB) or " (which is the ſame, x being infinite) $\frac{x}{x+1}r:\frac{x^2+x}{2}$: for $\frac{x^2+x}{2}.x^2$ ($::x+1.$ " $2.x.$) $::\frac{1}{2}r:\frac{x^2+x}{2}:\frac{x+1}{x}r:\frac{x^2+x}{2}$: and becauſe if from the ſeries of ordinates " in the ellipſis A C B, there remains the ſeries of ordinates in B C E, the complement of the ellipſis; therefore the ſeries of ordinates in B C E, the complement of the ellipſis, divided by the ſeries of triangular numbers A C D reſpectively, is the aggregate of all the times: But this aggregate is ſtill the " ſame, becauſe x is ſtill the ſame, the number of ſides being always infinite. " Therefore the bullet deſcends from all parts of this curve in the ſame time.

" Next I ſay, that this curve is a cycloid; for in the triangle M D E, M D and " D E being equal to D C, and divided into as many equal parts Eq, qs, su. &c. " as there are ſides in the curve H X C, and the radius of the quadrant D P F, " which is alſo equal thereunto, divided in the ſame manner; the ſides of the " triangles Epq, Ers, Etu, &c. are proportional to the triangles Hba, bdc, " dfe, &c. and therefore pq, μq, ($=Eq$.) $::$ Ha. ab. and rs. λs ($=Es$) " $::$ bc. cd. and ſo of the reſt; and therefore $HI=ab+cd+ef$. $If=Ha$ " $+bc+de::\mu q+\lambda s+\kappa u.\ pq+rs+tu$. that is, their number being infinite, H I, the intercepted diameter, is to If, the ordinate, as the reſpective " triangle $E\kappa u$, to the reſpective proportion $FtuE$; and therefore A H. H I $::$ " the triangle E M D. the triangle $E\kappa u$; but the triangle E M D. the triangle " $E\kappa u::ED\times ED.\ Eu\times Eu$. And $Eu\times Eu=ED\times E\tau$. ($ED.\ Eu.$ " $E\tau::$ as will preſently appear); therefore E M D. $E\kappa u$ $::$ $ED\times ED.\ ED$ " $\times E\tau::ED.\ E\tau$; therefore A H. H F $::$ ED. $E\tau$; but $AH=ED$; there- " fore $HI=E\tau$. and Eu, the ſide of the reſpective triangle, is the mean pro- " portional between A H and H I. Now becauſe Eu is the mean proportional " between E D and $E\tau$; therefore $E\tau\times\frac{1}{2}ED$ equals the triangle $E\kappa u$. And " now becauſe D R E is a ſemicircle, therefore $D\sigma E$ a rectangle triangle. And " becauſe DEt is an angle common to both triangles ($DE\sigma$ and tEu) and the " hypothenuſe of both are equal ($tE=ED$) therefore $D\sigma=tu$, and $E\sigma=Eu$. " therefore ED. $E\sigma$ ($=Eu$. $E\tau$ are in continual proportion (as was ſaid " before) and the two rectangule triangles $D\sigma E$ and tuE are equal; but the " the triangle $D\sigma E=\sigma\tau\times\frac{1}{2}ED$; therefore the triangle $tuE=\sigma\tau\frac{1}{2}ED$. " And becauſe $tF=$the arch σE. therefore $tF\times\frac{1}{2}ED=$ the arch $\sigma E\times\frac{1}{2}ED$. " But tF equals the ſector tEF; therefore the ſector $tEF=$ to the arch σE " $\times\frac{1}{2}ED$; therefore the portion $EFtu$ ($=$ the ſector $tEF+$ the triangle tuE) " $=$ the arch $\sigma E\times\frac{1}{2}ED+\sigma\tau\times\frac{1}{2}ED$. Therefore the triangle $E\kappa u$, is to " the portion $EFtu$, as $Et\times\frac{1}{2}ED$ is to $\sigma E\times\frac{1}{2}ED$, is to $\sigma E\times\frac{1}{2}ED\times$ " $\sigma\tau\frac{1}{2}ED::E\tau.\ \sigma E+\sigma\tau$. but $E\tau=HI$ the intercepted diameter; there-

“ fore $\tau\sigma + \sigma E$ is the ordinate; therefore this curve is a cycloid: But if the cheeks
“ of a pendulum be a cycloid of the altitude of half the pendulum, the bullet
“ (I ſay) vibrates in a cycloid: For X *b* being infinitely ſmall, that is, but a
“ point, X *b*, continued, that is X M is the tangent to that point, that is, to the
“ point X; (and becauſe X V is to X M, as X *i* to X *b*; and X *i* is to X *b*, as
“ the ſide of the reſpective triangle is to the diameter; and the ſide of the reſpective
“ triangle is to the diameter, as the intercepted diameter is to the ſide
“ of the reſpective triangle; that is, as X V to the mean proportional between
“ the diameter and it; therefore X M is the mean, that is, X M is the mean
“ proportional between A H or & V and X V); and becauſe the aggregate of
“ all the terms *a b*, *c d*, *e f*, &c. *uſque ad i* X, equals X V; therefore ſo many
“ times X *i* = twice X V; and therefore as many times X *b* (that is, the
“ curve H X) = twice X M. (And therefore if the diameter be divided according
“ to the odd numbers, 1, 3, 5, 7, *&c.* and ordinates drawn through theſe
“ points, the cycloid H X C is divided by thoſe ordinates into equal parts).
“ Therefore, L M being a tangent to the cycloid at the point L, M N = L M;
“ therefore the point N is in the ſemicircle M N F = M L B; and becauſe the
“ angle H M N is equal to the angle V M X, which is the complement of the
“ angle L B C, and H M = A B the complement of B C = M D, therefore M N
“ cuts the ſemicircle at the interſection thereof with the cycloid: Therefore N
“ is in the cycloid H N E. *Quod, &c.*”

Mr. Rooke's *Directions for ſeamen bound for far voyages* was ordered to be regiſtered [p], and a copy of them to be brought to Sir Robert Moray as ſoon as poſſible, and the original to be delivered to Mr. Colwall.

Dr. Wren ſhewed his experiment of filling a veſſel with water, which emptied itſelf when filled at a certain height.

Mr. Brooke ſubſcribed his name.

January 29. The lord viſcount Brouncker brought in a paper, propounding a way of common meaſure; of which ſeveral copies were ordered to be made.

His lordſhip alſo delivered in his account of *The recoiling of guns*; which was ordered to be regiſtered [q], and was afterwards printed by Dr. Sprat [r].

Sir William Petty promiſed to communicate to the next meeting his obſervations on the vibration of pendulums as a meaſure.

Dr. Goddard related, that he had filled a glaſs-globe with water, and put it into a ſkellet of water on the fire; and by boiling, the globe evacuated itſelf a third part; and being let cool, filled itſelf again.

Dr. Wren read a paper concerning weather-glaſſes.

[p] Vol. i. p. 149. They are printed in Philoſ. Tranſact. n° 8. p. 141. Jan. 1665.

[q] Regiſter-book, vol. i. p. 143.

[r] Hiſt. of Roy. Soc. p. 233.

The Genoeſe ambaſſador gave the ſociety a viſit, and was entertained with the ſight of Mr. Boyle's air-pump.

Joseph Williamson, eſq; was propoſed as a candidate by Mr. Povey.

February 5. Mr. Thomas Street preſented the ſociety with his *Aſtronomia Carolina*, printed at London in 1661, in 4to, for which he received their thanks.

Dr. Whistler brought in a book, intituled, *Natural and Political Obſervations upon the Bills of Mortality, by* John Graunt, *citizen of London,* printed at London in 1662, in 4to; and the doctor read the epiſtle-dedicatory, addreſſed to Sir Robert Moray, the preſident, by the author, who ſent fifty copies of the book to be diſtributed among the members of the ſociety; for which thanks were ordered to be returned to him, and he was propoſed as a candidate [a].

Mr. Williamson was admitted into the ſociety.

Sir George Lane was propoſed as a candidate by Sir William Petty.

Henry Proby, eſq; formerly propoſed by Dr. Wilkins, was now admitted into the ſociety.

Sir William Petty, Dr. Baynes, Mr. Brooke, Mr. Rooke, the lord viſcount Brouncker, and Mr. Balle, were appointed a committee, to examine a paper concerning muſic, read by Mr. Brooke.

Dr. Wren was deſired to think of an eaſy way for an univerſal meaſure, different from that of a pendulum:

Dr. Henshaw to bring in writing to the next meeting an account of his experiment of water forced out of a glaſs by boiling, and returning into the glaſs after the external water, in which it was ſet, was cooled: And

Sir Robert Paston to communicate an account of plaiſter of Paris, and bronze.

It was ordered, that the amanuenſis provide againſt the next meeting a frame for the quickſilver experiment of Mr. Balle: And

To make a copy of the form of the obligation, to which every member at his admiſſion ſubſcribed: and either himſelf, or the operator, to attend the members now in arrears at their reſpective houſes, in order to ſhew them the ſaid copy, and to deſire them to pay their arrears due by virtue of that obligation.

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[a] Dr. Sprat, Hiſt. of Roy. Soc. p. 67, mentions, that Mr. Graunt was, tho' a ſhop-keeper of London, recommended by the king himſelf to the ſociety; and that his majeſty gave this particular charge to them, that if they found any more ſuch tradeſmen, they ſhould admit them.

February 12. Mr. Hill was deſired to procure from his brother Kircher's ſecret way of muſic[r]: And

Dr. Goddard to bring in an account of his experiment of a glaſs filled with cold water, and then put into other water in a ſkellet or other veſſel, and heated, *&c.*

The amanuenſis was ordered to provide a leaden pipe of thirty-three feet long, and a glaſs pipe as long as could be procured.

Dr. Wren propoſed black-lead as a better means than oil for preſerving the pivots of the wheels of watches or clocks from grating or wearing out.

Mr. Palmer ſuggeſted bell-metal to be better than any other on account of its hardneſs, for the pivots of wheels to run in.

Dr. Wren propoſed to try a watch in Mr. Boyle's engine.

A committee conſiſting of Sir William Petty, Dr. Needham, Dr. Wilkins, Dr. Goddard, Dr. Ent, and Dr. Whistler, was appointed to examine Mr. Graunt's obſervations on the bills of mortality.

Mr. Proby ſubſcribed his name.

Mr. Winthrop promiſed to deliver in an account of ſtrange tides at the next meeting.

Sir Robert Moray brought in a paper of inquiries into the cauſe of the fulmination of gold, written by Dr. Charlton, which was read.

February 19. The amanuenſis was directed to provide againſt the next meeting the leaden pipe and the glaſs one, for which he had received orders before.

Alexander Stanhope, eſq; was propoſed as a candidate by the lord viſcount Brouncker.

Sir George Lane was admitted into the ſociety.

Mr. Williamson ſubſcribed his name.

The vegetation of plants was diſcourſed of.

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[r] Probably that jeſuit's *Muſurgia univerſalis; ſive ars magna conſoni & diſſoni, in decem libros digeſta; quâ univerſa ſonorum doctrina & philoſophia, muſicæque tam theoricæ quam practicæ ſcientia traditur.* Rome 1650, two vol. fol.

Dr. Henshaw was deſired to try the experiment of the increaſe of weight in a tree: And

Dr. Wilkins to make a trial of mint growing in a vial with water.

February 26. Mr. Balle was requeſted to ſpeak with Sir William Persall about his experiments of the loadſtone.

Mr. Stanhope, Mr. Graunt, and Dr. Power were elected into the ſociety.

Dr. Power ſent to the ſociety a paper concerning ſome experiments of his relating to the riſe of water in ſmall tubes.

Trades were diſcourſed of.

Sir William Petty promiſed to produce on that day fortnight his paper concerning trades.

The purging of gold with antimony was another ſubject of diſcourſe.

Dr. Goddard, Dr. Whistler, Dr. Clarke, and Mr. Croune were deſired to make the diſſections of rabbets; and that each of them would do it ſingly.

March 5. Mr Graunt and Mr. Stanhope ſubſcribed their names.

The amanuenſis was ordered to attend Dr. Wren, to take directions concerning the experiment of the water in the long tube.

Sir Robert Moray read ſome letters[a] from Monſieur Huygens, concerning ſome experiments made by him with Mr. Boyle's engine, as he had altered it.

Mr. Rooke and Mr. Croune were deſired to try the experiment mentioned by Monſieur Huygens of a feather to be let fall before and after the exſuction of the air in the ſaid engine: And

Sir William to make ſome trial with the needles and load-ſtone at the next meeting.

The account of the refining of gold was ordered to be brought in at the next meeting by Dr. Goddard, Dr. Whistler, and Mr. Winthrop.

March 12. Mr. Boyle ſhewed a compoſition called *Ruſma*, which being put upon an hairy arm, took off the hair without pain in a very ſhort time, as two or three minutes.

Sir William Persall made ſome experiments of the load-ſtone, and was deſired to bring an account of them in writing.

[a] Letter-book, vol. i. p. 26. 23. and 63.

It was ordered, that the amanuenſis make three copies of the equation of days, ſent by Monſieur HUYGENS to Sir ROBERT MORAY, and tranſlate them as ſoon as poſſible:

That the operator go to Radcliffe for the glaſs tubes, made by Mr. GOURNEY for the long leaden tube: And

That he make the ſounding inſtrument ready againſt the Friday following, at two in the afternoon.

March 19. Mr. BOYLE ſhewed a glaſs vial, which was corroded with a liquor at the top, and had an hole made by it at the bottom.

Dr. CHARLTON read the epiſtle of a book of problems, dedicated to the king by Mr. HOBBES [w].

The lord viſcount BROUNCKER gave an account of the ſinking of a wooden ball in the water; and was deſired with Mr. BOYLE to go to the ſea, and try the experiment there.

It was ordered, that the amanuenſis cauſe the wooden balls, which are to plumb the depth of the ſea, to be blacked over with oily colours: And

That the operator go the next morning to the plumber, and order him to erect the leaden pipe at Greſham College; and to go the day following to Radcliffe for the glaſs-tube.

Mr. BOYLE was deſired to proſecute his experiment of ſounds.

Mr. EVELYN brought in a paper containing an account of three pots with earth in them, wherein he had ſowed three ſeveral ſorts of ſeeds for the farther trial of the increaſe and weight.

1662. *March* 26. Sir ROBERT MORAY read the following account of *An experiment of the inſtrument for ſounding of depths without a line or cord, made the 19th of March* $160\frac{1}{2}$, by the lord viſcount BROUNCKER and himſelf; which was ordered to be regiſtered [x], and a copy of it to be ſent to the Trinity-houſe.

"The globe was of maple wood, $5\frac{11}{16}$ inches in diameter, weighing $2\frac{1}{4}$ lb. having in it a hook of iron for bearing of the lead.

"The lead of a conical figure, 11 inches long, $1\frac{9}{16}$ inch at the top, and $\frac{9}{16}$ inch at bottom in diameter, with a wire at top making an angle of ſome 60 degrees with the ſide of the lead, which weighed $4\frac{1}{2}$ lb.

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[w] *Problemata phyſica*, printed at London in 1662, in 4to.

[x] Vol. i p. 153. See Philoſophical Tranſactions, vol. ii. nº 24. p. 439, for April 1667.

" The depth of the water being about 19 foot; between the immerſion of the " globe and emerſion thereof there intervened upon reiterated trials ſtill 6 ſeconds " of an hour, meaſured by a ſecond watch.

" At the depth of about 10 foot there intervened conſtantly $3\frac{1}{2}$ ſeconds, or " thereabouts.

" They found no difference in time of the ſubmerſions of the globe at the " greateſt depth, when it roſe ſome two wherries lengths from the place where it " was let fall (being carried by the current of the tide) and when it roſe within a " yard or ſo of the ſame place where it was let fall.

" The wooden globe did always riſe quite above the ſuperfice of the water, when " it was let fall at the greateſt depth.

" The globe being put into the water without the weight, the ſuperfice of the " water covered it to about $\frac{2}{3}$ of the diameter."

Mr. ROOKE read his *Direction for the obſervations of the eclipſes of the moon*; which was ordered to be regiſtered [r], and two copies of it to be made.

Dr. GODDARD was deſired to bring in an account of the purgation of gold by antimony; and another of the experiment of water in the long leaden tube.

The amanuenſis was ordered to go to Radcliffe, and beſpeak large receivers of glaſs as thick as poſſible, with an hole in the bottom capable of receiving a man's arm: And

That he make cement for Mr. ROOKE, according to Monſieur HUYGENS's directions.

Sir PETER WYCHE was propoſed as a candidate by Mr. COLWALL.

April 2. Dr. GODDARD was deſired to proſecute the experiment of the long tube.

Sir PETER WYCHE was admitted into the ſociety.

Sir HENRY DE VIC was propoſed as a candidate by Sir ROBERT MORAY.

The amanuenſis was ordered to write out the *Inquiries for foreign parts*, and to deliver them to Mr. BOYLE; and it was directed, that among theſe inquiries be inſerted one, whether the rain-water varies in weight, trial thereof being made in divers places.

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[r] Regiſter-book, vol. i. p. 154. It is printed in the Philoſophical Tranſactions, nº 22. p. 388. Feb. 1666. and in the Hiſtory of the Royal Society, p. 180.

Sir Robert Moray ſhewed leaves of gold-beaters made of ox-guts, brought from Holland; upon which it was ordered, that the amanuenſis procure ſome of thoſe, which were made in England.

It was reſolved, that every member of the ſociety ſhall conſider againſt the next meeting of ſome experiment, which he will undertake himſelf.

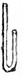
April 9. Dr. Goddard read an account of his trials with ſeveral liquors in the long leaden tube, and was deſired to try farther the experiments with oil and milk.

Dr. Wilkins brought in three Latin certificates concerning the report of the voiding of ſeeds by one Anna Vos; which were publicly read by Mr. Rooke, and ordered to be filed.

Dr. Clarke related his injecting of a medicine made of an infuſion of agaric and ſenna into a dog's leg, which killed the dog.

Robert Southwell, eſq; was propoſed as a candidate by Mr. Boyle.

April 16. Mr. Rooke read a paper concerning muſic, brought in by Mr. Brooke.



April 23. Mr. Boyle brought in a glaſs-tube, bent as in the margin, (the ſhort end of which was ſealed up) containing water for compreſſing the air.

Mr. Winthrop ſhewed a tin lamp, called a bladder's lamp, burning high like a candle, continually feeding itſelf; of which a diagram was ordered to be made and regiſtered.

He alſo produced malleable mineral lead, and a piece of a rock of Granite.

Mr. Rooke read his account of oil put in the long tube; and it was ordered to be kept, till it ſhould be completed.

The amanuenſis was directed to take care to procure the long glaſs-tube, which Mr. Colney promiſed to make.

Mr. Boyle gave an account of his weighing of air, and was requeſted to proſecute his experiment.

Sir Robert Moray read his propoſition for experiments to be made under ground in deep pits.

Dr. Wilkins read the following letter from Dr. Power to Mr. Croune concerning ſome magnetical experiments; which was ordered to be entered into the letter-book [a]:

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[a] Vol. i. p. 31.

" HONOURED SIR,

" My laſt, I hope, you have received. I have been ſince tampering with the " load-ſtone, and I think have happily lighted of another experiment, which will " advance the hypotheſis I formerly delivered unto you, *viz.* that the effluviums " of all magnetics do not proceed *ab intrinſeco*, but are channelled through magne- " tic bodies, as light through a burning-glaſs. Take the experiment (which I " would have you annex to my former) here as followeth:

" *Experimentum magneticum novum.*

" Take a rod of iron for a puncheon; heat it red-hot, and according to the " laws of its refrigeration you may endue this or that extreme with what polarity " you pleaſe now: afterwards by ſtriking it with a hammer in the ſame poſture " as it was cooled, you may much advance and invigorate its magnetic virtue, as we " have formerly declared to you. But now the main obſervable of all is, that af- " ter both the reception of the virtue aforeſaid by convenient refrigeration, as alſo " the augmentation of it by percuſſion, you may, by inverting and repercuſſing " the extremes, alter the polarity of the iron at your pleaſure: and farther (which " is as ſtrange) if you ſtrongly ſtrike the iron in the middle betwixt the two ex- " tremes, it will deſtroy all magnetiſm formerly acquired.

" Which experiment does not only evince the magnetical fluors to proceed *ab* " *extra*, and to enter the body of iron, according to the line and direction of the " percuſſions; but alſo may be a leading experiment to farther diſcoveries.

" What farther advances we ſhall make of it here, your honourable ſociety ſhall " not fail to know. But indeed I want the noble aſſiſtance of ſuch ingenioſos, as " you daily enjoy, both to encourage and farther ſuch endeavours.

" Be pleaſed, I pray you, to let me have a few lines from you of Dr. WREN's " inſtrument, and an anſwer to what other particulars of my laſt letter you think " fitting. At preſent excuſe the ſcribbling haſte of,

Hallifax this 24th.
of March, 1661.

SIR,

Your moſt affectionate Servant,

HENRY POWER."

Dr. BAYNES was deſired to take upon him in his travels, to inquire about ſuch things, as the ſociety will direct him to.

Mr. BRERETON, Mr. ROOKE, Mr. BROOKE, Mr. HILL, the lord viſcount BROUNCKER, Sir WILLIAM PETTY, Dr. BAYNES, Mr. BALLE, and Dr. PETT were appointed a committee to examine the ſynopſis of Mr. BERCHENSHA.

Dr. Wilkins was deſired to bring in a piece of hanging tinged with ſeveral colours.

April 30. Mr. Le Febure brought in a maſs of *Calx viva* and honey; and alſo a cryſtal of ſaltpetre ſeparated after it had been mixt with ſugar and roſe-water: as likewiſe a little of a metallic tincture, which being thrown into water, tinged at firſt but by reflection; but after the water was ſtirred, was tinged throughout with a clear purple colour. He was deſired to give the receit of them all three.

Mr. Winthrop produced a little ſtone, of which one part was, as it came from the rock, of an amethyſt colour, and the other after calcination of a fleſh colour.

He brought alſo a piece of wood called *Lignum colubrinum*, or in Dutch *Schlangen holtz*; the taſte of which is bitter.

Sir Robert Moray read his account of the ſatellites of Jupiter on Friday the 25th of this month.

The operator was ordered to provide againſt the next meeting two birds, one a chicken and another bird, and a live mouſe or two.

Mr. Hill was deſired to procure ſome of the water brought from the Eaſt-Indies, to be compared with that of this country.

It was ordered, that two or three carps bladders be provided againſt the next meeting.

The experiments, agreed on for the next meeting, were the exerciſe of Mr. Boyle's engine, and to put a carp's bladder into the long tube.

May 7. Mr. Boyle's engine was exerciſed on the arms of ſeveral of the members of the ſociety, who found, that the air being pumped out, their arms were drawn into the receiver.

Sir Henry de Vic and Mr. Southwell were admitted into the ſociety.

Mr. Boyle produced a glaſs for trying the difference of the ſtrength of corroſive liquors.

Mr. Oldenburg produced a letter concerning a level of the air.

Mr. Boyle ſhewed two tranſparent liquors, which being mixed together, made a white *coagulum*.

Sir William Petty brought in *An apparatus to the hiſtory of the common practices of dying*; which was ordered to be regiſtered [a].

It was reſolved, that the firſt thing to be done at the next meeting, be the experiment of diſſolving fleſh by a liquor of Mr. Boyle.

May 14. Mr. Boyle ſhewed his experiment of diſſolving a piece of boiled mutton; which being minced ſmall, and put into an empty veſſel, a brown-coloured liquor was poured on it; and immediately waxed ſo hot, that a perſon could not bear his hand under the glaſs; and the meat and liquor became one ſubſtance like thick blood.

Mr. Evelyn preſented the ſociety with a written book of the hiſtory of the rolling-preſs; which was ordered to be filled up.

Mr. Southwell ſubſcribed his name.

He produced a great horn, ſaid to be an unicorn's; and ſhewed alſo a little one, which grew on a cock's head, being the ſpur of the fowl cut cloſe till it bled, and ſet on the head immediately after the comb was taken off (it being ſqueezed on, and a few aſhes ſtrewed thereon to ſtaunch the blood) when the cock was freſh caponed.

Dr. Wilkins produced a piece of tinged hanging.

It was ordered, that no original paper be taken away by any member before it be regiſtered, without the leave of the ſociety.

Mr. Haak was deſired to tranſlate an Italian treatiſe concerning dying.

The experiment of putting the hand into Mr. Boyle's engine, was directed to be repeated by Dr. Wilkins: and alſo an experiment to be made in it with a viper.

The operator was ordered to provide a crop pigeon againſt the next meeting, to be put into Mr. Boyle's engine.

Mr. Proby promiſed to peruſe the ſtatute-books for manufactures.

Dr. Wallis gave an account of a young man deaf and dumb, who, after three months inſtruction by him, was brought to ſpeak words very plainly [b]. The doctor was deſired to bring the young man to the next meeting of the ſociety.

May 21. Dr. Wilkins preſident.

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[a] Regiſter-book, vol i. p. 1. It is printed in Dr. Sprat's Hiſt. of the Roy Soc. p. 284.

[b] Dr. Wallis in a letter to Mr. Oldenburg, dated at Oxford, December 30, 1661, printed in Mr. Boyle's works, vol. v. p. 511. gives an account of this attempt of his: "I am now employed, "ſays he, upon another work, as hard almoſt as to "make Mr. Hobbes underſtand mathematics. It "is to teach a perſon dumb and deaf to ſpeak, "and to underſtand a language, &c.

Dr. Wallis brought with him the young man born deaf and dumb, and made him pronounce ſeveral words; and was deſired to continue his practice upon him.

Sir William Petty, Dr. Goddard, Mr. Rooke, Mr. Boyle, and Dr. Wilkins, were appointed a committee for the examining Mr. Towgood's water-works; and any other members, who ſhould think proper, might aſſiſt the committee therein.

May 28. Dr. Wilkins preſident.

Dr. Ent was deſired to bring in at the next meeting his box of little animals, which make a noiſe, called the death-watch.

The operator was ordered to provide little fiſhes, as ſmall pikes, and to keep them in glaſs-bottles, ſhifting the bottles with water every day; and this was directed to be done in Dr. Goddard's lodgings, that he might take care, that his ſervant and the operator did not fail in their attendance upon this buſineſs.

The biſhop of Exeter[b], related the intention of a perſon of quality to aſſiſt the ſociety in their experiments: upon which it was propoſed to make a draught of the ſociety's deſign, in order to be ſhewn to ſuch as might be benefactors.

Mr. Boyle ſhewed the aſcent of water in white ſand in a glaſs tube.

Sir William Petty was deſired to go with Mr. Webb, and ſeek out the beſt dyers pump; and Mr. Oldenburg to ſpeak to Mr. Towgood to provide himſelf with a ſhip and pump, and to give an account when he ſhall be ready.

June 4. Dr. Wilkins preſident.

William Winde, eſq; was propoſed as a candidate by Dr. Wilkins.

Mr. Boyle produced two of prince Rupert's draught-pieces in print.

Mr. Croune produced two embryos of puppy-dogs, which he had kept eight days, and were put in ſpirit of wine in a glaſs-vial ſealed hermetically.

Mr. Boyle promiſed to make the like experiment in rabbets.

The lord viſcount Brouncker was deſired to bring to the next meeting his paper of experiments, to be regiſtered.

Dr. Wilkins brought two dead inſects, called death-watches, which Dr. Ent had promiſed to produce.

Dr. Goddard ſhewed an human embryo, two inches long.

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[b] Probably Dr. Seth Ward; for biſhop Gauden was elected to the ſee of Worceſter May 23, 1662.

It was ordered, that thoſe members, who were deſirous to ſee Mr. Towgood's engine compared with a pump, might meet at the Temple in the church, at ten, on the Saturday following.

The operator was directed to provide as ſmall fiſhes as he could procure, and to keep them in diſtilled rain-water.

Mr. Boyle related, that letting ſtand a tube with ſand in water for thirty hours, he found, that the water had aſcended twenty-four inches. He was deſired to proſecute that experiment.

The lord viſcount Brouncker, Sir Robert Moray, Sir William Petty, Dr. Goddard, and Dr. Wilkins were appointed a committee to draw up a paper concerning the deſign of the ſociety.

The amanuenſis was ordered to make a fair draught of the information concerning the royal ſociety, and to deliver it to the biſhop of Exeter.

Mr. Balle, Dr. Pope, the lord viſcount Brouncker, and Sir Robert Moray were deſired to try the variation of the needle at Whitehall: And

Mr. Croune to inquire about the hanging of a carp.

Ralph Cudworth, D. D. and Henry More, D. D. were propoſed as candidates by Dr. Wilkins.

June 11. Sir Robert Moray preſident.

Dr. Pett's brother ſhewed a draught of the pleaſure-boat, which he intended to make for the king.

The lord Berkley, of Berkley Caſtle, preſented the ſociety with a bird of Paradiſe, having two feet.

Dr. Goddard ſhewed a moth with feathered wings.

Mr. Evelyn preſented his book, entituled *Sculptura*; *or*, *the hiſtory and art of Chalcography*, printed this year at London in 8vo.

It was ordered, that Mr. Balle be deſired to produce his magnetical inſtruments.

Mr. Boyle preſented the ſociety with a book concerning the weight and ſpring of the air; and alſo with a glaſs-tube filled with minium, with which the experiment of filtring was made.

The amanuenſis was ordered to inquire about the depth of the water under the arches of London-bridge.

Mr. Croune was deſired to write to Dr. Power, about the trial of heat and cold in deep caves.

The amanuenſis was ordered to beſpeak the long glaſs tube for the Torricellian experiment.

June 18. Sir Robert Moray preſident.

Mr. Palmer ſhewed three pieces of painted ſilk ſtuff.

Mr. Croune read Mr. Evelyn's account of the rolling-preſs.

Dr. Goddard ſet ſeveral pieces of gold to anneal, and thereby ſhewed their alloys.

Mr. Palmer was deſired to ſpeak to Mr. Gregory to come to the ſociety, and inform them concerning the tinged ſtuffs.

Dr. Goddard read his account of the experiments of refining of gold with antimony; which was ordered to be regiſtered[c]; and was afterwards publiſhed in the *Philoſophical Tranſactions*[d].

Sir Robert Moray read his *Account of the ſounding of the depth of the ſea between Portſmouth and the Iſle of Wight, with the wooden globe and lead*; which was ordered to be regiſtered[e], and was as follows:

" Time of the ſubmerſion and ſtay of the globe under water.	Meaſure of the depth by a line.
Seconds.	Yards.
22	32
23	33
$7\frac{1}{2}$	11
10	15
6	9
6	$9\frac{1}{2}$
$13\frac{1}{2}$	21

" The time was meaſured by the vibrations of a piece of lead of about a pound " weight, of a conical figure, hung at a ſmall pack-thread of about $36\frac{2}{10}$ inches " meaſured from the center of gravity of the lead.

" The firſt two experiments were leaſt exact, becauſe not ſo often repeated as the " reſt, in regard to the current of the tide, which drew the boat to ſhallower water.

" The others were repeated each of them twice or thrice.

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[c] Regiſter-book, vol. i. p. 167.

[d] N° 138. p. 953. March 1678.

[e] Regiſter-book, vol. i. p. 178.

“ The globe, when it came up at the greateſt depth, leaped quite out of the wa-
“ ter: but the agitation of the waves hindered the exact obſervation of it.”

The operator was ordered to inquire concerning the length of time, during which fiſhermen keep their fiſh under water without feeding.

Sir WILLIAM PETTY propoſed a ſtandard for knowing the velocity of ſwimming bodies.

June 25. Mr. BOYLE preſident.

Mr. BOYLE brought in a glaſs with a compoſition in it, inſtead of a foil, for the making of looking-glaſſes.

PETER PETT, eſq; and Mr. WILLIAM SCHROTER, were propoſed as candidates by Mr. BOYLE; as was JAMES HAYES, eſq; by Dr. WILKINS.

The operator gave an account of what he had done with reſpect to ſmall fiſhes.

Mr. CROUNE and Mr. HILL were appointed a committee to review MERSENNUS concerning the tenacity of bodies.

Mr. WINTHROP was deſired to communicate in writing the manner of making pitch and tar.

July 2. Sir ROBERT MORAY preſident.

It was ordered, that the committee appointed to view Mr. TOWGOOD's engine, meet the Saturday following, at two in the afternoon, in the Temple church.

Mr. BOYLE produced an experiment of the irregular motion of the oil of terebinthine upon ſpirit of wine; and likewiſe a mixture of fixt nitre reſolved in diſtilled rain-water and ſpirit of wine, which ſhot into pieces.

Mr. BALLE produced two living crickets.

A new aſtronomical hypotheſis of a ſtranger was referred to the conſideration of the biſhop of Exeter[f], Dr. WREN, Dr. POPE, Mr. CROUNE, and Mr. OLDENBURG.

A new method of muſic was recommended to the lord viſcount BROUNCKER, Sir WILLIAM PETTY, Mr. BOYLE, Mr. BROOKE, and Mr. BALLE.

July 9. Sir ROBERT MORAY preſident.

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[f] Dr. WARD, who was elected to that ſee July 8, 1662.

Mr. OLDENBURG read a paper of collections concerning the generation of inſects; and was deſired to tranſlate the whole book.

Mr. WINTHROP read his hiſtory of the making tar and pitch in New England; and was deſired to proſecute it.

A report being made to the ſociety by the lord viſcount BROUNCKER, that Sir HENEAGE FINCH, his majeſty's ſolicitor general, having ſigned the docket of the bill by him prepared for his majeſty's ſignature, in order to letters patents for incorporating the ſociety, had refuſed the fees due to him for the ſame out of reſpect to the ſaid ſociety; it was thereupon put to the queſtion, and reſolved, that Mr. Solicitor general be eſteemed and accounted a benefactor to the ſociety: and it was likewiſe ordered, that Sir JOHN FINCH, Dr. BAYNES, Sir WILLIAM PETTY, Dr. GODDARD, and Mr. PALMER, be appointed a committee to wait upon Mr. Solicitor, and give him the thanks of the ſociety for his ſaid favour and reſpect unto them.

The account of Mr. TOWGOOD's engine was deferred till Dr. WILKINS ſhould give in his report concerning it, or till Mr. TOWGOOD ſhould do it himſelf.

Dr. WREN and Dr. POPE were deſired to continue the obſervations of Jupiter's ſatellites.

Before the next meeting of the ſociety a charter paſſed on the 15th of July *1662*, for the incorporation of the ſociety under the title of the Royal Society, and appointing WILLIAM lord BROUNCKER the firſt preſident, and Sir ROBERT MORAY, knt. ROBERT BOYLE eſq; WILLIAM BRERETON eſq; eldeſt ſon of WILLIAM lord BRERETON, Sir KENELME DIGBY, knt. and chancellor to the queen mother, Sir PAUL NEILE, knt. one of the gentlemen of the privy chamber, HENRY SLINGESBY, eſq; another of the ſaid gentlemen of the privy chamber, Sir WILLIAM PETTY, knt. JOHN WALLIS, D. D. TIMOTHY CLARKE, M. D. and one of the phyſicians to his majeſty, JOHN WILKINS, D. D. GEORGE ENT, M. D. WILLIAM AERSKINE. eſq; cup-bearer to his majeſty, JONATHAN GODDARD, M. D. and profeſſor of phyſic in Greſham College, CHRISTOPHER WREN, L. L. D.[f], and Savilian profeſſor of aſtronomy at Oxford, WILLIAM BALLE, eſq; MATTHEW WREN, eſq; JOHN EVELYN, eſq; THOMAS HENSHAW, eſq; DUDLEY PALMER of Grey's-Inn, eſq; and HENRY OLDENBURG, eſq; of the council; WILLIAM BALLE, eſq; the firſt treaſurer; and Dr. JOHN WILKINS and Mr. OLDENBURG the firſt ſecretaries: all theſe officers to continue in their reſpective offices till St. Andrew's day following, the day of the anniverſary election. The charter was in the following terms:

" CAROLUS ſecundus Dei gratia Angliæ, Scotiæ, Franciæ & Hiberniæ rex, fidei
" defenſor, &c. omnibus, ad quos præſentes literæ pervenerint, ſalutem. Diu
" multumque apud nos ſtatuimus, ut imperii fines, ſic etiam artes atque ſcientias
" ipſas promovere. Favemus itaque omnibus diſciplinis, particulari autem gratia
" indulgemus philoſophicis ſtudiis, præſertim iis, quæ ſolidis experimentis conantur
" aut novam extundere philoſophiam, aut expolire veterem. Ut igitur inclareſcant

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[f] *He is by miſtake ſtiled doctor of phyſic in the charter.*

“ apud noſtros hujuſmodi ſtudia, quæ nuſquam terrarum adhuc ſatis emicuerunt; utque nos tandem univerſus literarum orbis non ſolum fidei defenſorem, ſed etiam veritatis omnimodæ & cultorem ubique & patronum ſemper agnoſcat: ſciatis, quod nos de gratia noſtra ſpeciali ac ex certa ſcientia & mero motu noſtris ordinavimus conſtituimus conceſſimus & declaravimus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris ordinamus conſtituimus concedimus & declaramus, quod de caetero in perpetuum erit ſocietas de præſidente[g] concilio & ſodalibus conſiſtens, quæ vocabitur & nuncupabitur Regalis Societas; & eandem ſocietatem, per nomen præſidis concilii & ſodalium regalis ſocietatis, unum corpus corporatum & politicum in re facto & nomine realiter & ad plenum pro nobis heredibus & ſucceſſoribus noſtris facimus ordinamus creamus & conſtituimus per præſentes, & quod per idem nomen habeant ſucceſſionem perpetuam: & quod ipſi & eorum ſucceſſores (quorum ſtudia applicanda ſunt ad rerum naturalium artiumque utilium ſcientias experimentorum fide ulterius promovendas) per idem nomen præſidis concilii & ſodalium Regalis Societatis prædictæ, ſint & erunt perpetuis futuris temporibus perſonæ habiles & in lege capaces ad habendum perquirendum percipiendum & poſſidendum terras & tenementa prata paſcua paſturas libertates privilegia francheſias juriſdictiones & hereditamenta quæcunque ſibi & ſucceſſoribus ſuis in feodo & perpetuitate, vel pro termino vitæ vitarum vel annorum, ſeu aliter quocunque modo, ac etiam bona & catalla ac omnes alias res cujuſcunque fuerint generis naturæ ſpeciei ſive qualitatis; necnon ad dandum concedendum dimittendum & aſſignandum eadem terras tenementa & hereditamenta bona & catalla, & omnia facta & res neceſſarias faciendum & exequendum de & concernentia eiſdem[h], per nomen prædictum: & quod per nomen præſidis concilii & ſodalium Regalis Societatis prædictum placitare & implacitari, reſpondere & reſponderi, defendere & defendi, de cætero in perpetuum valeant & poſſint, in quibuſcunque curiis placeis & locis, & coram quibuſcunque judicibus & juſticiariis & aliis perſonis & officiariis noſtris heredum & ſucceſſorum noſtrorum, in omnibus & ſingulis actionibus placitis ſectis querelis cauſis materiis rebus & demandis quibuſcunque, cujuſcunque ſint aut erunt generis naturæ vel ſpeciei; eiſdem modo & forma, prout aliqui ligei noſtri intra hoc regnum noſtrum Angliæ, perſonæ habiles & in lege capaces, aut ut aliquod corpus corporatum vel politicum intra hoc regnum noſtrum Angliæ, habere perquirere recipere poſſidere dare & concedere, placitare & implacitari, reſpondere & reſponderi, defendere vel defendi, valeant & poſſint, valeat & poſſit: & quod iidem præſes concilium & ſodales Regalis Societatis prædictæ & ſucceſſores ſui habeant in perpetuum commune ſigillum, pro cauſis & negotiis ſuis & ſucceſſorum ſuorum quibuſcunque agendis deſerviturum; & quod bene liceat & licebit eiſdem præſidi concilio & ſodalibus Regalis Societatis prædictæ, & ſucceſſoribus ſuis pro tempore exiſtentibus ſigillum illud de tempore in tempus frangere mutare & de novo facere, prout iis melius fore videbitur expediri. Et, quod intentio noſtra regia meliorem ſortiatur effectum, ac pro bono regimine & gubernatione prædictæ Regalis Societatis de tempore in tempus, volumus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris concedimus iiſdem præſidi concilio & ſodalibus Societatis Regalis prædictæ & ſucceſſoribus ſuis, quod de cætero in perpetuum concilium

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[g] *Sic in* Authentic.

[h] *Sic in* Authentic.

“ prædictum erit & conſiſtet ex viginti & una perſonis (quarum præſidem ſemper
“ unum eſſe volumus) & quod omnes & ſingulæ aliæ perſonæ, quæ intra unum
“ menſem proximum ſequentem poſt datum præſentium per præſidem & concilium,
“ & in omni tempore ſequenti per præſidem concilium & ſodales, in eandem
“ ſocietatem accipientur & admittentur ut membra Regalis Societatis prædictæ, &
“ in regiſtro per ipſos conſervando annotatæ fuerint, erunt vocabuntur & nuncupabuntur
“ ſodales Regalis Societatis prædictæ: quos, quanto eminentius omnis
“ generis doctrinæ bonarumque literarum ſtudio clareſcant, quanto ardentius hujuſce
“ ſocietatis honorem ſtudia & emolumentum promoveri cupiant, quanto vitæ
“ integritate morumque probitate ac pietate emineant, & fidelitate animique erga
“ nos coronam & dignitatem noſtram ſincero affectu polleant; eo magis idoneos
“ & dignos, qui in ſodalium ejuſdem ſocietatis numerum adſciſcantur, omnino
“ cenſeri volumus. Et, pro meliori executione voluntatis & conceſſionis noſtræ
“ in hac parte, aſſignavimus nominavimus conſtituimus & fecimus, ac per præſentes
“ pro nobis heredibus & ſucceſſoribus noſtris aſſignamus nominamus conſtituimus
“ & facimus, prædilectum & fidelem nobis WILLIELMUM vicecomitem
“ BROUNCKER, cancellarium præchariſſimæ conſorti noſtræ reginæ CATHERINÆ,
“ fore & eſſe primum & modernum præſidem Regalis Societatis prædictæ; volentes
“ quod prædictus WILLIELMUS vicecomes BROUNCKER in officio præſidis Regalis
“ Societatis prædictæ a datu præſentium uſque ad feſtum ſancti Andreæ
“ proximum ſequens poſt datum præſentium continuabit, & quouſque unus alius
“ de concilio Regalis Societatis prædictæ pro tempore exiſtente ad officium illud debito
“ modo electus præfectus & juratus fuerit, juxta ordinationem & proviſionem
“ in his præſentibus inferius expreſſam & declaratam (ſi prædictus WILLIELMUS
“ vicecomes BROUNCKER tam diu vixerit) ſacramento corporali in omnibus & per
“ omnia officium illud tangentia bene & fideliter exequendum, ſecundum veram
“ intentionem harum præſentium, coram prædilecto & perquam fideli conſanguineo
“ & conſiliario noſtro EDWARDO comite CLARENDON cancellario noſtro
“ Angliæ prius præſtito; cui quidem EDWARDO comiti CLARENDON cancellario
“ noſtro prædicto ſacramentum prædictum adminiſtrare plenam poteſtatem & authoritatem
“ damus & concedimus, in haec verba ſequentia, viz. *I* WILLIAM viſcount
“ BROUNKER *do promiſe to deal faithfully and honeſtly in all things belonging to*
“ *the truſt committed to me, as preſident of this Royal Society, during my employment in*
“ *that capacity. So help me God.* Aſſignavimus etiam conſtituimus & fecimus, ac
“ per præſentes pro nobis heredibus & ſucceſſoribus noſtris facimus, dilectos nobis
“ & fideles ROBERTUM MORAY militem unum a ſecretioribus noſtris conciliis in
“ regno noſtro Scotiæ, ROBERTUM BOYLE armigerum, WILLIELMUM BRERETON
“ armigerum filium primogenirum baronis de BRERETON, KENELM. DIGBY militem
“ præchariſſimæ matri noſtræ MARIÆ reginæ cancellarium, PAULUM NEILE
“ militem unum generoſorum cameræ privatæ noſtræ, HENRICUM SLINGESBY armigerum
“ alium generoſorum prædictæ privatæ cameræ noſtræ, WILLIELMUM
“ PETTY militem, JOHANNEM WALLIS in theologia doctorem, TIMOTHEUM
“ CLARKE in medicinis doctorem & unum medicorum noſtrorum, JOHANNEM
“ WILKINS in theologia doctorem, GEORGIUM ENT in medicinis doctorem,
“ WILLIELMUM AERSKINE unum a poculis noſtris, JONATHAN GODDARD in medicinis
“ doctorem & profeſſorem collegii de Greſham, CHRISTOPHERUM WREN
“ in medicinis doctorem Saville aſtronomiæ profeſſorem in academia noſtra Oxoni-

“ enſi, Willielmum Balle armigerum, Matthæum Wren armigerum, Johannem Evelyn armigerum, Thomam Henshaw armigerum, Dudly Palmer de Grey's-Inn in comitatu noſtro Middleſexiæ armigerum, & Henricum Oldenburg armigerum, una cum præſide prædicto, fore & eſſe primos & modernos viginti & unum de concilio Regalis Societatis prædictæ, continuandos in eiſdem officiis a datu præſentium uſque ad prædictum feſtum ſancti Andreæ apoſtoli proximum ſequens, & deinde quouſque aliæ idoneæ perſonæ & habiles & ſufficientes in officia prædicta electæ præfectæ & juratæ fuerint (ſi tam diu vixerint, aut pro aliqua juſta & rationabili cauſa non amotæ[1] fuerint) ſacramentis corporalibus coram præſide prædictæ Regalis Societatis ad officia ſua bene & fideliter in omnibus & per omnia officia illa tangentia exequendum prius præſtandis, ſecundum formam & effectum prædicti ſacramenti, mutatis mutandis, præſidi Regalis Societatis prædictæ per cancellarium noſtrum Angliæ adminiſtrandi (cui quidem præſidi pro tempore exiſtenti ſacramenta prædicta adminiſtrare plenam poteſtatem & authoritatem pro nobis heredibus & ſucceſſoribus noſtris damus & concedimus per præſentes) & quod eædem perſonæ ſic, ut præfertur, ad concilium prædictæ Regalis Societatis electæ præfectæ & juratæ, & in poſterum eligendæ præficiendæ & jurandæ de tempore in tempus, erunt & exiſtent auxiliantes conſulentes & aſſiſtentes in omnibus materiis rebus & negotiis meliorem regulationem gubernationem & directionem prædictæ Regalis Societatis, & cujuſlibet membri ejuſdem, tangentibus ſeu concernentibus.

“ Et ulterius volumus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris concedimus præfatis præſidi concilio & ſodalibus Regalis Societatis prædictæ & ſucceſſoribus ſuis, quod præſes concilium & ſodales Regalis Societatis prædictæ pro tempore exiſtentes (quorum præſidem pro tempore exiſtentem unum eſſe volumus) de tempore in tempus perpetuis futuris temporibus poteſtatem & authoritatem habeant & habebunt nominandi & eligendi, & quod eligere & nominare poſſint & valeant, quolibet anno in prædicto feſto ſancti Andreæ, unum de concilio prædictæ Regalis Societatis pro tempore exiſtente, qui ſit & erit præſes Regalis Societatis prædictæ uſque ad feſtum ſancti Andreæ apoſtoli exinde proximum ſequens (ſi tam diu vixerit, aut interim pro aliqua juſta & rationabili cauſa non amotus fuerit) & exinde, quouſque unus alius in officium præſidis Regalis Societatis prædictæ electus præfectus & nominatus fuerit; quodque ille, poſtquam ſic, ut præfertur, electus & nominatus fuerit in officium præſidis Regalis Societatis prædictæ, antequam ad officium illud admittatur, ſacramentum corporale coram concilio ejuſdem Regalis Societatis, aut aliquibus ſeptem vel pluribus eorum, ad officium illud recte bene & fideliter in omnibus officium illud tangentibus exequendum præſtabit, ſecundum formam & effectum prædicti ſacramenti, mutatis mutandis (cui quidem concilio, aut aliquibus ſeptem vel pluribus eorum, ſacramentum prædictum adminiſtrare pro nobis heredibus & ſucceſſoribus noſtris plenam poteſtatem & authoritatem de tempore in tempus, quotieſcunque neceſſarium fuerit, damus & concedimus per præſentes) & quod poſt hujuſmodi ſacramentum ſit, ut præfertur, præſtitum officium præſidis Regalis Societatis prædictæ uſque ad feſtum ſancti Andreæ apoſtoli exinde proximum ſequens exequi valeat & poſſit: & ſi contigerit præſidem Regalis Societatis prædictæ pro tempore exiſtentem aliquo tempore, quamdiu fuerit in officio præſidis

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[1] *Sic in* Authent.

“ ejuſdem Regalis Societatis obire vel ab officio ſuo amoveri; quod tunc & toties bene liceat & licebit concilio & ſodalibus prædictæ Regalis Societatis, vel aliquibus ſeptem vel pluribus eorum (quorum præſidem[k] concilii prædicti ad talem electionem ſemper unum eſſe volumus) alium de prædicto numero concilii prædicti in præſidem Regalis Societatis prædictæ eligere & præficere; & quod ille ſic electus & præfectus officium illud habeat & exerceat durante reſiduo ejuſdem anni, & quouſque alius ad officium illud debito modo electus & juratus fuerit, ſacramento corporali in forma ultime ſpecificata prius præſtando; & ſic toties quoties caſus ſic acciderit. Et ulterius volumus, quod quandocunque contigerit aliquem vel aliquos de concilio Regalis Societatis prædictæ pro tempore exiſtente mori, vel ab officio illo amoveri, vel decedere (quos quidem de concilio Regalis Societatis prædictæ & eorum quemlibet pro male ſe gerendo aut aliqua alia rationabili cauſa amobiles eſſe volumus ad beneplacitum præſidis & cæterorum de concilio prædicto ſuperviventium & in officio illo remanentium vel majoris partis eorundem, quorum præſidem pro tempore exiſtentem unum eſſe volumus) quod tunc & toties bene liceat & licebit præfatis præſidi concilio & ſodalibus Regalis Societatis prædictæ, vel majori parti eorundem (quorum præſidem Regalis Societatis prædictæ pro tempore exiſtentem unum eſſe volumus) unum alium vel plures alios de ſodalibus Regalis Societatis prædictæ, loco ſive locis ipſius vel ipſorum ſic mortuorum decedentium vel amotorum, ad ſupplendum prædictum numerum viginti & unius perſonarum de concilio Regalis Societatis prædictæ nominare eligere & præficere: & quod ille ſive illi ſic in officio illo electi & præfecti[l] idem officium habeat & habeant uſque ad feſtum ſancti Andreæ apoſtoli tunc proximum ſequens, & exinde, quouſque unus alius vel plures alii electus præfectus & nominatus fuerit electi præfecti & nominati fuerint; ſacramento corporali ad officium illud in omnibus & per omnia officium illud tangentia coram præſide & concilio Regalis Societatis prædictæ, vel aliquibus ſeptem vel pluribus eorum pro tempore exiſtentibus, bene & fideliter exequendum, ſecundum veram intentionem præſentium, prius præſtando. Et ulterius volumus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris concedimus præfatis præſidi concilio & ſodalibus prædictæ Regalis Societatis & ſucceſſoribus ſuis, quod ipſi & ſucceſſores ſui quolibet anno, in prædicto feſto ſancti Andreæ apoſtoli, plenam poteſtatem & authoritatem habeant & habebunt eligendi nominandi præficiendi & mutandi decem de ſodalibus Regalis Societatis prædictæ, ad ſupplendum loca & officia decem prædicti numeri viginti & unius de concilio Regalis Societatis prædictæ; quoniam regiam voluntatem noſtram eſſe declaramus, & per præſentes pro nobis heredibus & ſucceſſoribus noſtris concedimus, quod decem de concilio prædicto, & non amplius, per præſidem concilium & ſodales Regalis Societatis prædictæ annuatim mutati & amoti fuerint. Volumus etiam, & pro nobis heredibus & ſucceſſoribus noſtris concedimus præfatis præſidi concilio & ſodalibus prædictæ Regalis Societatis & ſucceſſoribus ſuis, quod ſi contigerit præſidem ejuſdem Regalis Societatis pro tempore exiſtentem ægritudine vel infirmitate detineri, vel in ſervitio noſtro heredum vel ſucceſſorum noſtrorum verſari, vel aliter eſſe occupatum, ita quod neceſſariis negotiis ejuſdem Regalis Societatis officium præſidis tangentibus attendere non poterit; quod tunc &

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[k] *Sic in* Authent.

[l] *Sic in* Authent.

“ toties bene liceat & licebit eidem præſidi ſic detento verſato vel occupato unum
“ de concilio prædictæ Regalis Societatis pro tempore exiſtente, fore & eſſe depu-
“ tatum ejuſdem præſidis, nominare & appunctuare: qui quidem deputatus, in
“ officio deputati præſidis prædicti ſic faciendus & cunſtituendus, ſit & erit depu-
“ tatus ejuſdem præſidis de tempore in tempus, toties quoties prædictus præſes ſic
“ abeſſe cuntigerit, durante toto tempore, quo prædictus præſes in officio præſidis
“ continuaverit; niſi interim prædictus præſes Regalis Societatis prædictæ pro
“ tempore exiſtens unum alium de prædicto concilio ejus deputatum fecerit & con-
“ ſtituerit: & quod quilibet hujuſmodi deputatus prædicti præſidis, ſic, ut præ-
“ fertur, fiendus[m] & conſtituendus omnia & ſingula, quæ ad officium præſidis præ-
“ dictæ Regalis Societatis pertinent ſeu pertinere debent, vel per prædictum præ-
“ ſidem virtute harum literarum noſtrarum patentium limitata & appunctata fore[n]
“ facienda & exequenda de tempore in tempus, toties quoties prædictus præſes ſic
“ abeſſe contigerit, durante tali tempore, quo deputatus prædicti præſidis continu-
“ averit, facere & exequi valeat & poſſit, vigore harum literarum nuſtrarum paten-
“ tium, adeo plene libere & integre ac in tam amplis modo & forma, prout præſes
“ prædictus, ſi præſens eſſet, illa facere & exequi valeret & poſſet; ſacramento
“ corporali ſuper ſancta Dei evangelia in forma & effectu ultime ſpecificatis per
“ hujuſmodi deputatum ad omnia & ſingula, quæ ad officium præſidis pertinent,
“ bene & fideliter exequendum, coram præfato concilio prædictæ Regalis Socie-
“ tatis, vel aliquibus ſeptem vel pluribus eorum, prius præſtando; & ſic toties
“ quoties caſus ſi acciderit: cui quidem concilio, vel aliquibus ſeptem vel pluribus
“ eorum pro tempore exiſtentibus, ſacramentum prædictum adminiſtrare poteſta-
“ tem & authoritatem, quoties caſus ſic acciderit, damus & concedimus per præ-
“ ſentes, abſque aliquo brevi commiſſione ſive ulteriori warranto in ea parte a nobis
“ heredibus vel ſucceſſoribus noſtris procurando ſeu obtinendo. Et ulterius volu-
“ mus, ac per præſentes pro nobis heredibus & ſucceſſuribus noſtris concedimus
“ præfatis præſidi concilio & ſodalibus Regalis Societatis prædictæ & ſucceſſori-
“ bus ſuis, quod ipſi & ſucceſſores ſui de cætero in perpetuum habeant & habe-
“ bunt unum theſaurarium, duos ſecretarios, unum clericum, & duos ſervientes
“ ad clavas qui de tempore in tempus ſuper præſidem attendant; quodque præ-
“ dicti theſaurarius ſecretarii clericus & ſervientes ad clavas eligendi & nominandi,
“ antequam ad officia ſua ſeparalia & reſpectiva exequendum admittantur, ſacra-
“ menta ſua corporalia in forma & effectu ultime ſpecificatis, coram præſide &
“ concilio ejuſdem Regalis Societatis, aut aliquibus ſeptem vel pluribus eorum,
“ officia ſua ſeparalia & reſpectiva in omnibus illa tangentibus recte bene & fideli-
“ ter exequendum præſtabunt; & quod poſt hujuſmodi ſacramenta ſic, ut præ-
“ fertur, præſtita officia ſua reſpectiva exerceant & utantur: quibus quidem præ-
“ ſidi & concilio, aut aliquibus ſeptem vel pluribus eorum, ſacramenta prædicta
“ de tempore in tempus adminiſtrare prædictis ſeparalibus & reſpectivis officiariis
“ & ſucceſſoribus ſuis plenam poteſtatem & authoritatem damus & concedimus
“ per præſentes: & aſſignavimus nominavimus elegimus creavimus conſtituimus
“ & fecimus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris aſſig-
“ namus nominamus eligimus creamus conſtituimus & facimus, dilectos ſubditos
“ noſtros WILLIELMUM BALLE armigerum fore & eſſe primum & modernum

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[m] *Sic in* Authent.

[n] *Sic in* Authent.

" theſaurarium, & prædictum [o] JOHANNEM WILKINS & HENRICUM OLDENBURG
" fore & eſſe primos & modernos ſecretarios prædictæ Regalis Societatis, continuandos
" in eiſdem officiis uſque ad prædictum feſtum ſancti Andreæ apoſtoli
" proximum ſequens poſt datum præſentium: quodque de tempore in tempus &
" ad omnia tempora in prædicto feſto ſancti Andreæ apoſtoli (ſi non fuerit dies
" dominicus, &, ſi fuerit dies dominicus, tunc die proxime ſequenti) præſes concilium
" & ſodales prædictæ Regalis Societatis pro tempore exiſtentes, aut major
" pars eorundem (quorum præſidem pro tempore exiſtentem unum eſſe volumus)
" alios probos & diſcretos viros de tempore in tempus in theſaurarium, ſecretarios,
" clericum, & ſervientes ad clavas prædictæ Regalis Societatis, eligere nominare
" & præficere valeant & poſſint; quodque illi, qui in ſeparalia & reſpectiva
" officia prædicta ſic, ut præfertur, electi præfecti & jurati fuerint, officia illa
" reſpectiva exercere & gaudere poſſint & valeant uſque ad prædictum feſtum
" ſancti Andreæ extunc proximum ſequens, ſacramentis ſuis prædictis ſic, ut præfertur,
" prius præſtandis; & ſic toties quoties caſus ſic acciderit: & ſi contigerit
" aliquem vel aliquos officiariorum prædictorum ejuſdem Regalis Societatis obire,
" vel ab officiis ſuis reſpectivis amoveri; quod tunc & toties bene liceat & licebit
" præſidi concilio & ſodalibus prædictæ Regalis Societatis, vel majori parti eorundem
" (quorum præſidem pro tempore exiſtentem unum eſſe volumus) alium
" vel alios in officium ſive officia illarum perſonarum ſic defunctarum ſive amotarum
" eligere & præficere; & quod ille ſive illi ſic electus & præfectus electi &
" præfecti officia prædicta reſpectiva habeat & exerceat habeant & exerceant durante
" reſiduo ejuſdem anni, & quouſque alius ſive alii ad officia illa reſpectiva debito
" modo electus & juratus fuerit electi & jurati fuerint; & ſic toties quoties
" caſus ſic acciderit. Et inſuper volumus, ac de gratia noſtra ſpeciali ac ex certa
" ſcientia & mero motu noſtris concedimus præfatis præſidi concilio & ſodalibus
" Regalis Societatis prædictæ & ſucceſſoribus ſuis, quod præſes & concilium prædictæ
" Regalis Societatis pro tempore exiſtentes, & major pars eorundem (quorum
" præſidem pro tempore exiſtentem unum eſſe volumus) pariter congregare
" & aſſemblare poſſint & valeant in collegio ſive alio publico loco ſive aula intra
" civitatem noſtram London, vel in aliquo alio loco conveniente intra decem milliaria
" ejuſdem civitatis noſtræ; & quod ipſi ſic congregati & aſſemblati habebunt
" & habeant plenam authoritatem poteſtatem & facultatem de tempore in tempus
" condendi conſtituendi ordinandi faciendi & ſtabiliendi hujuſmodi leges ſtatuta
" jura ordinationes & conſtitutiones, quæ eis, aut eorum majori parti, bona ſalubria
" utilia honeſta & neceſſaria juxta eorum ſanas diſcretiones fore videbuntur,
" & omnia quæcunque alia negotiis & rebus Regalis Societatis prædictæ ſpectantia [p]
" agendi & faciendi; quæ omnia & ſingula leges ſtatuta jura ordinationes &
" conſtitutiones ſic, ut præfertur, facienda volumus, & per præſentes pro nobis
" heredibus & ſucceſſoribus noſtris firmiter injungendo præcipimus & mandamus,
" quod de tempore in tempus inviolabiliter obſervata fuerint, ſecundum tenorem
" & effectum eorundem: ita tamen, quod prædicta leges ſtatuta jura ordinationes
" & conſtitutiones ſic, ut præfertur, facienda & eorum quælibet ſint rationabilia,
" & non ſint repugnantia nec contraria legibus conſuetudinibus juribus ſive ſtatutis
" hujus regni noſtri Angliæ. Et ulterius de ampliori gratia noſtra ſpeciali

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[o] *Sic in* Authent. [p] *Sic in* Authent.

“ ac ex certa ſcientia & mero motu noſtris dedimus & conceſſimus, ac per
“ præſentes pro nobis heredibus & ſucceſſoribus noſtris damus & concedimus,
“ præfatis concilio & ſodalibus prædictæ Regalis Societatis & ſucceſſoribus ſuis
“ plenam poteſtatem & authoritatem de tempore in tempus eligendi nominan-
“ di & conſtituendi unum vel plures typographos ſive impreſſores, & chalco-
“ graphos ſeu ſculptores; et ipſi vel ipſis per ſcriptum communi ſigillo prædictæ
“ Regalis Societatis ſigillatum, & manu præſidis pro tempore exiſtentis ſignatum,
“ facultatem concedendi, ut imprimant talia res materias & negotia prædictam ſo-
“ cietatem tangentia vel concernentia, qualia prædictis typographo vel impreſſori,
“ chalcographo vel ſculptori, vel typographis vel impreſſoribus, chalcographis
“ vel ſculptoribus, de tempore in tempus per præſidem et concilium prædictæ
“ Regalis Societatis, vel aliquos ſeptem vel plures eorum (quorum præſidem pro
“ tempore exiſtentem unum eſſe volumus) commiſſa fuerint; ſacramentis ſuis cor-
“ poralibus, antequam ad officia ſua exercendum admittantur, coram præſide &
“ conſilio pro tempore exiſtentibus, vel aliquibus ſeptem vel pluribus eorum, in
“ forma et effectu ultime ſpecificatis, prius præſtandis; quibus quidem præſidi &
“ concilio, vel aliquibus ſeptem vel pluribus eorum, ſacramenta prædicta admi-
“ niſtrare plenam poteſtatem & authoritatem damus & concedimus per præſenſes.
“ Et ulterius, quod prædicti præſes concilium & ſodales prædictæ Regalis Societa-
“ tis in philoſophicis ſuis ſtudiis meliorem ſortiantur effectum, de ampliori gratia
“ noſtri ſpeciali ac ex certa ſcientia et mero motu noſtris dedimus et conceſſimus,
“ ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris damus & concedi-
“ mus, prædictis præſidi concilio & ſodalibus prædictæ Regalis Societatis & ſuc-
“ ceſſoribus ſuis, quod ipſi & ſucceſſores ſui de tempore in tempus habeant & ha-
“ bebunt plenam poteſtatem & authoritatem de tempore in tempus, & ad talia
“ tempeſtiva tempora, ſecundum eorum diſcretionem, requirere capere & reci-
“ pere cadavera talium perſonarum, quæ mortem manu carnificis paſſæ fuerunt, &
“ ea anatomizare, in tam amplis modo & forma, & ad omnes intentiones & pro-
“ poſita, prout Collegium Medicorum & Corporatio Chirurgorum civitatis noſtræ
“ *London* eiſdem cadaveribus uſi vel gaviſi fuerunt, aut uti vel gaudere valeant
“ & poſſint. Et ulterius, pro melioratione experimentorum artium & ſcientia-
“ rum prædictæ Regalis Societatis, de abundantiori gratia noſtra ſpeciali ac ex
“ certa ſcientia & mero motu noſtris dedimus & conceſſimus, ac per præſentes
“ pro nobis heredibus & ſucceſſoribus noſtris damus & concedimus, præfatis præ-
“ ſidi concilio & ſodalibus prædictæ Regalis Societatis & ſucceſſoribus ſuis, quod
“ ipſi & ſucceſſores ſui de tempore in tempus habeant & habebunt plenam poteſta-
“ tem & authoritatem per literas vel epiſtolas, ſub manu prædicti præſidis in præ-
“ ſentia concilii, vel aliquorum ſeptem vel plurium eorum, & in nomine Regalis
“ Societatis, ac communi ſigillo ſuo prædicto ſigillatas, mutuis intelligentiis fru-
“ entur[q], & notitiis cum omnibus & omnimodis perſonis peregrinis & alienis,
“ utrum privatis vel collegiatis, corporatis vel politicis, abſque aliqua moleſta-
“ tione interruptione vel inquietatione quæcunque: Proviſo tamen, quod hæc in-
“ dulgentia noſtra ſic, ut præfertur, conceſſa ad ulteriorem non extendatur uſum,
“ quam particulare beneficium & intereſſe prædictæ Regalis Societatis in materiis
“ ſeu rebus philoſophicis mathematicis aut mechanicis. Et ulterius dedimus &

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[q] *Sic in* Authent.

“ conceſſimus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris damus & concedimus, præfatis præſidi concilio & ſodalibus Regalis Societatis prædictæ & ſucceſſoribus ſuis plenam poteſtatem & authoritatem erigendi ædificandi & extruendi, aut erigi ædificari & extrui faciendi vel cauſandi, intra civitatem noſtram *London*, vel decem milliaria ejuſdem, unum vel plura collegium vel collegia cujuſcunque modi vel qualitatis, pro habitatione aſſemblatione & congregatione prædictorum præſidis concilii & ſodalium prædictæ Regalis Societatis & ſucceſſorum ſuorum, negotia ſua & alias res eandem Regalem Societatem concernentia ad ordinandum & diſponendum. Et ulterius volumus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris ordinamus conſtituimus & appunctuamus, quod ſi aliqui abuſus vel diſcrepantiæ in poſterium orientur & accident de gubernatione aut aliis rebus vel negotiis prædictæ Regalis Societatis, unde ejuſdem conſtitutioni ſtabilimini & ſtudiorum progreſſui vel rebus & negotiis aliqua inferatur injuria vel impedimentum; quod tunc & toties per præſentes pro nobis heredibus & ſucceſſoribus noſtris authorizamus nominamus aſſignamus & conſtituimus præfatum prædilectum & perquam fidelem conſanguineum & conciliarium noſtrum EDWARDUM comitem CLARENDON, cancellarium noſtrum regni noſtri Angliæ, per ſeipſum durante vita ſua, & poſt ejus mortem tunc archiepiſcopum Cantuarienſem, cancellarium vel cuſtodem magni ſigilli Angliæ, Theſaurarium Angliæ, epiſcopum Londinenſem, cuſtodem privati ſigilli, & duos principales ſecretarios, pro tempore exiſtentes, aut aliquos quatuor vel plures eorum, eaſdem diſcrepantias & abuſus reconciliare componere & reducere. Et ulterius volumus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris firmiter injungendo præcipimus & mandamus omnibus & ſingulis juſticiariis, majoribus, aldermannis, vicecomitibus, ballivis, conſtabulariis, & aliis officiariis miniſtris & ſubditis noſtris heredum & ſucceſſorum noſtrorum quibuſcunque; quod de tempore in tempus ſint auxiliantes & aſſiſtentes prædictis præſidi concilio & ſodalibus Regalis Societatis prædictæ & ſucceſſoribus ſuis in omnibus & per omnia, ſecundum veram intentionem harum literarum noſtrarum patentium. Eo, quod expreſſâ mentio de vero valore annuo, vel de certitudine præmiſſorum ſive eorum alicujus, aut de aliis donis ſive conceſſionibus per nos ſeu per aliquem progenitorum ſive prædeceſſorum noſtrorum, præfatis præſidi concilio & ſodalibus Regalis Societatis ante hæc tempora factis, in præſentibus minime facta exiſtit, aut aliquo ſtatuto actu ordinatione proviſione proclamatione ſive reſtrictione in contrarium inde antehac habitis factis editis ordinatis ſive proviſis, aut aliqua alia re cauſa vel materia quacunque, in aliquo non obſtante. In cujus rei teſtimonium has literas noſtras fieri fecimus patentes. Teſte meipſo apud Weſtmonaſterium, quinto decimo die Julii, anno regni noſtri decimo quarto.

Per ipſum regem.

HOWARD.”

Read the 15th of Auguſt 1662.

Not long before the paſſing of this patent, the ſociety loſt, by death, one of its moſt conſiderable members, Mr. LAURENCE ROOKE, deſcended from a good family of that name at Monks Horton in Kent [r], and born at Deptford in that county [s], about the year 1622 [t]. From Eton-ſchool, where he had his firſt education, he was tranſplanted to King's-college in Cambridge, in 1639 [u], but he was not a ſcholar of the houſe [w]. He was admitted to the degree of bachelor of arts by proxy, on account of illneſs, on the 29th of February, $164\frac{3}{4}$, and in 1647 commenced maſter of arts [x]; and then retired to his eſtate in Kent. But in the year 1650 he went to Oxford, and ſettled in Wadham-college, for the ſake of Dr. WILKINS, who was then warden, and Mr. SETH WARD, the Savilian profeſſor of aſtronomy, a member of that college [y]. The aſſemblies of ſeveral learned and curious gentlemen at the warden's lodgings, for the purpoſe of cultivating natural and experimental philoſophy, being highly agreeable to Mr. ROOKE's genius and courſe of ſtudies, he was admitted among them, becoming a gentleman commoner of Wadham-college, where he continued ſome years, accompanying Mr. BOYLE in his chemical operations [z].

He was choſen to ſucceed Mr. SAMUEL FOSTER, deceaſed, in the profeſſorſhip of aſtronomy at Greſham-college, on the 23d of July, 1652. He made ſome obſervations at Oxford upon the comet, that appeared in December of that year, which were publiſhed the year following in Mr. SETH WARD's *Prælectio de Cometis*, printed at Oxford in 4to; and in the year 1655, Dr. WALLIS dedicated to theſe two friends of his his treatiſe *De Sectionibus Conicis.*

Upon Dr. WHISTLER's reſignation of the profeſſorſhip of geometry in Greſham-college, Aug. 7, 1657, Mr. ROOKE was permitted to exchange that of aſtronomy for it; probably for the conveniency of the lodgings, which opened behind the reading hall, and on that account were proper for the reception of thoſe gentlemen, after the lectures, who were afterwards incorporated under the name of the Royal Society, the inſtitution of which was zealouſly promoted by Mr. ROOKE [a].

The marquis of DORCHESTER, who was not only a patron of learning, but a conſiderable maſter of it himſelf, having a peculiar regard for Mr. ROOKE, uſed to entertain him, after the reſtoration, at his ſeat at Highgate, and bring him every Wedneſday in his coach to the meeting of the Royal Society at Greſham-college. But the laſt time Mr. ROOKE was at Highgate, walking from thence in the heat of the ſummer, he caught cold, which occaſioned a fever, that put an end to his life at his apartment in Greſham-college, on the 27th of June, 1662 [b], on the very night, which he had for ſome years expected, wherein to finiſh his accurate obſervations on the ſatellites of Jupiter [c]. And ſo intent was he to the laſt upon completing his theory of that planet, that during the ſickneſs, which proved fatal to him, after mentioning to Dr. Pope, that he wanted but one obſervation more, that which might be made on the night of his death, to perfect that theory, he deſired him to go to the Royal Society, and requeſt of them, that ſince it was now impoſſible for him to make that obſervation, they would appoint ſome other perſon to do it [d]. By a nuncupatory will, he left what he had to Dr. Ward [e], not long before advanced to the biſhopric of Exeter, whom he permitted to receive what was due upon bond, if the perſons bound offered payment willingly; otherwiſe, he would not have the bonds put in ſuit: "For, ſaid he, as I never was in law, or had "any contention with any man in my life, neither would I after my death [f]." He was interred very decently by the biſhop of Exeter in the church of St. Martin Outwich in Biſhopſgate-ſtreet, his corps being attended by moſt of the fellows of the Royal Society then in London. The biſhop deſigned likewiſe at firſt to have erected a monument to him, with an inſcription drawn up by Dr. Bathurst; but afterwards, inſtead of that, gave the Royal Society, in memory of his friend, a large pendulum clock, made by Fromantel, which was ſet up in the room, where they met in Greſham-college, but is now out in the hall of their houſe in Crane-court, Fleetſtreet, with theſe words engraven upon the middle of the dial-plate:

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[r] WOOD's Athen. Oxon. vol ii. col. 297.

[s] Dr. WARD's Lives of the Profeſſors of Greſham-college, p. 90.

[t] In the epitaph on him, written by Dr. BATHURST, he is ſaid to have been in the 40th year of his age at his death, in 1662.

[u] WOOD, ubi ſupra.

[w] Dr. WARD, ubi ſupra.

[x] Id. ib.

[y] WOOD, ubi ſupra.

[z] Id. ib.

[a] Dr. WARD, ubi ſupra, p. 91.

[b] Dr. POPE's Life of Dr. SETH WARD, biſhop of Saliſbury, p. 119—121.

SOCIETATI REGALI AD SCIENTIAM NATURALEM PRIMOVENDAM INSTITUTÆ
DONO DEDIT
REVERENDUS IN CHRISTO PATER SETHUS EPISCOPO EXON.
EJUSDEM SOCIETATIS SODALIS
IN MEMORIAM
LAURENTII ROOKE,
IN OMNI LITERARUM GENERE INSTRUCTISSIMI
IN COLLEGIO GRESHAMANSI PRIMUM ASTRONOMIÆ
DEIN GEOMETRIÆ PROFESSORIS
DICTÆQUE SOCIETATIS NUPER SODALIS, QUI OBIIT JUNII XXVI [g]. MDCLXI.

He was of a melancholy temper and aſpect, his complexion ſwarthy, his eyes more than ordinarily ſunk in his head, and his voice hoarſe and inward. He was profoundly ſkilled in all ſorts of learning, not excepting botany and muſic, and the moſt abſtruſe points of divinity; always averſe from aſſerting any thing poſitively, that was dubious; and when aſked his opinion of an hypotheſis, uſually anſwering, *I have no opinion*; extremely modeſt, and ſparing of his words, unleſs amongſt his intimate friends [h]. Mr. Hooke [i] places him with thoſe moſt eminent for their knowledge and improvement in aſtronomy. Dr. Sprat [k] deſcribes him as a man of a profound judgment, a vaſt comprehenſion, prodigious memory, and ſolid experience. "His ſkill in the mathematics was reverenced by all lovers of theſe ſtudies; and his perfection in many other ſorts of learning deſerves no leſs admiration. But, above all, his knowledge had a right influence on the temper of his mind, which had all the humility, goodneſs, calmneſs, ſtrength, and ſincerity of a ſound and unaffected philoſopher." But whoever would view his character in its proper extent, will have great ſatisfaction in ſeeing it repreſented by the maſterly pen of his ſucceſſor, Dr. BARROW, in his inaugural oration at Greſham-college.

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[c] Spat's Hiſt. of the Royal Society, p. 189.

[d] Dr. Pope, ubi ſupra, p. 114.

[e] Dr. Ward's Lives, &c. p. 92.

[f] Dr. Pope, p. 120.

[g] Dr. Bathurst's Epitaph on him ſays, June 27; which difference muſt, as Dr. Ward, p. 93. ſuppoſes, ariſe from the hour of the night, when he expired, either before or after 12 o'clock.

[h] Dr. Pope, p. 111.

[i] *Preface* to his *Micrographia*.

[k] Hiſt. of the Royal Society, p. 189.

July 16. Sir ROBERT HARLEY ſubſcribed his name.

Mr. WINTHROP brought in the following account *Of the manner of making Tar and Pitch in New England*; which was ordered to be regiſtered[1]:

"Tar is made out of that ſort of pine-tree, out of which cometh naturally a kind of turpentine, which, at the firſt flowing out of the tree, is liquid and clear, but being hardened by drying upon the tree, or any place upon which it hath fallen, is not much unlike the Burgundy-pitch.

"The greateſt quantity of thoſe pines, of which tar and pitch is made, which are commonly called pitch-pines, grow upon the moſt barren plains, yet in ſome places upon rocky hills alſo; but ſuch hills are uſually amongſt thoſe plains. There are of thoſe pines in ſeveral parts of New England, but the moſt tar is made about Conecticut, above fifty miles up the river, where where be great plains of thoſe pines on both ſides the river, ſomething up into the land from the river ſide. There hath been tar alſo made in the colony of the Maſſachuſets, and New Plymouth: there are of thoſe plains alſo in many parts of the ſea-coaſt and up far into the country, and in the eaſtern parts towards Nova Scotia. In thoſe plains, and other places, where that pitch-pine groweth, are found many trees, which have been blown down, among which ſome have been lodged there ſo long time (it may be many ages) that the whole body of the tree, and all the boughs and roots thereof, are rotted, and only the knots of thoſe boughs left (thoſe knots are that part, where the bough is joined to the body of the tree). Thoſe knots will lie in the ſame diſtances as they grew upon the tree the whole length of the tree, and not any part of the body or boughs left, being all rotted and burnt up by the often burning of the ground, which is every year ſet on fire by the Indians; and ſo, with the dry withered graſs and weeds, are burnt up by degrees (ſome part one year, and ſome another) all the dry boughs, or other wood, ſound or rotten, that lieth amongſt them, except theſe pine knots, which only eſcape the fury of the fire, though ſcorched black, ſome of them, thereby. In ſome places where there is little graſs or woods, whereby the fire may run, the reſt of the bough is only rotted from the knot: theſe knots are apt enough to burn very fairly, where they are on a heap together, but lying ſingly they do not retain the fire, which paſſeth over them, which is the reaſon they are not conſumed like other dry rotten wood.

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[1] Regiſter-book, vol. i. p. 179.

"Theſe knots are the uſual material, of which the tar in that country is made, being full impregnated with that terebinthine or reſinous matter, which, by the heat of the fire, is driven out of them. It may appear of how balſamic a nature that is, that can preſerve the wood from rotting, it may be, many hundred years, though expoſed to all weathers; and it is evident, that thoſe knots have ſo continued a very long time; for there are upon the ſame plain trees, which have been blown down, that ſhew their ſeveral degrees of decay, and exceed the memory of the oldeſt of the natives, as to the time they were laid by the violence of the wind.

"The reſt of the tree doth contain (both bough and body) ſome of the like terebinthine ſap; for if a little chip of the tree, or of any bough, be cut, or ſome of the bark be taken off, there will, in a very ſhort time, appear little round exudations, like a dew, of pure cryſtalline turpentine; but this is little, and more undigeſted than that which is in the knots, and mixed with more watery ſap, leaving the wood more porous, and thereby ſubject to the impreſſions of the air and wet, whereby it ſoon decays. If it lies with the bark on, it ſooner rotteth, the decay being haſtened with worms, that breed between the bark and the wood.

"Thoſe, that intend to make tar, gather thoſe knots on heaps, and then carry them together by carts to ſome convenient place not far off, where they find clay or loam fit for their uſe; and in that place they make an hearth, of ſuch ordinary ſtone which is at hand and clay, ſo high from the ground, that a veſſel may ſtand a little lower than the hearth, for receiving the tar as it runs out. This hearth is made of wideneſs, according to the quantity of knots they will ſet at once: the hearth alſo is made with a ſmooth floor of clay, and they make the hearth a little deſcending from the outward parts towards the middle, and thence to one ſide, where there is a gutter left for the tar to run out.

"Upon this hearth they lay theſe knots, piling them up round together in the very ſame manner as thoſe that burn charcoal, of an height proportionable to the breadth of the hearth, when they cover them over with a coat of clay or loam, or the beſt ſort of earth the place will afford (but good clay is beſt, if it can be had near.) They leave only on the top a ſmall place open to put in fire, and for the ſmoak to go out, and ſome ſmall holes round about at ſeveral heights, for ſo much air to go in, as is needful for the fire, which is regulated by theſe vent-holes at pleaſure, ſtopping or opening them, or ſo many of them as there is cauſe. When this ſtructure is all thus fitted, fire is put to it at the top, and when it is well on fire, that open place is ſtopped alſo, except a little vent, as much as is needful to keep the fire burning, by venting this ſmoke; and when all beginneth to be thorough hot, the tar, with ſome mixture of watery ſap, will run downward to the hearth; and gathering from all parts toward the middle, runneth into that gutter before mentioned, and thence into a barrel or other veſſel there placed to receive the ſame. So that the whole art of making tar is no other but a diſtillation *per deſcenſum*, and may be alſo done in cloſe veſſels, by a fire encompaſſing a veſſel of earth or iron, in which the

“ pitch-wood may be contained; but the other way is found to be the eaſieſt and
“ moſt profitable way for making great quantities. When the tar is all run out,
“ they ſtop all the vents very cloſe (as the colliers do in making charcoal) ſo they
“ have theſe knots made into excellent charcoal, which the ſmiths find to be the
“ beſt ſort of coal for their uſe, that is made of wood, being not ſo apt to burn out
“ when their blaſt ceaſeth; neither do they ſparkle in the fire as many other ſort
“ of coals do; and when they want ſea-coal, they chooſe theſe rather than any
“ other, and give a greater price for them. Thoſe ſame knots the planters ſplit
“ out into ſmall ſhivers, about the thickneſs of a finger, or thinner; and thoſe
“ they burn inſtead of candles, giving a very good light, and they call it candle-wood,
“ and it is much uſed both in New England and Virginia, and among the
“ Dutch planters in the villages. But becauſe it is ſomething offenſive, by the
“ much ſullying ſmoke that comes from it, they uſually burn it in the chimney-corner
“ upon a flat ſtone or iron, except occaſionally a ſingle ſtick in their
“ hand, as there is need of light to go about the houſe. It muſt not be conceived,
“ by what is mentioned in the foregoing diſcourſe that only thoſe knots, ſeparated
“ from the body of the tree by devouring time, are the the only material,
“ out of which tar can be made; for there are in that country millions of living
“ trees, that have the ſame ſort of knots full of ſuch tupentine, of which, by that
“ kind of diſtillation, tar may be made: but the labour of felling the trees, and
“ cutting out thoſe knots, would far exceed the value of the tar, that ſhould be
“ the recompence of that labour, eſpecially in that country, where labour is
“ very dear.

“ But theſe knots heretofore mentioned are provided without any other labour
“ than gathering together; and there is alſo ſometimes found of thoſe ſorts of
“ pine-trees, whoſe whole body of the lower part towards the root is as full of
“ turpentine as the knots; and of thoſe alſo tar may be made in like manner as
“ the former; but ſuch trees being rarely found, we commonly preſerve to ſplit
“ out into candle-wood, becauſe they will be eaſily riven out into any length
“ and bigneſs deſired, much better than knots. There is an opinion, that by art,
“ the body of any living pine-tree, the lower part of it, ſix or eight feet high,
“ may be as fully impregnate with turpentine as the knots. And ſome have reported,
“ that ſuch artifice is uſed in Norway. Several trials have been made
“ to that end, by girdling the tree (as they call it; cutting off ſome of the bark
“ round, and a little into the wood of the tree, about ſix feet from the ground;
“ which hath not yet been found ſucceſsful: but whether the right ſeaſon of the
“ year was not taken, or what elſe omitted, is not known to thoſe, that have
“ miſſed in ſuch trials. It were worth inquiring, whether any ſuch art be uſed in
“ Norway or Sweden, or elſewhere; and what it is. Of tar, by boiling it a ſufficient
“ height, pitch is made. In ſome places, where roſin is plenty and cheap,
“ a fit proportion of that may be diſſolved in tar while it is boiling, and ſo
“ mixing with it, it ſooner is boiled to pitch; but this is ſomething of different
“ kind from that, which is made of tar only without other mixture.

“ There is another way, which ſome ſhip carpenters in that country have uſed
“ to bring their tar into pitch for any ſudden uſe, which is thus: The tar is

“ made ſo hot in an iron kettle over the fire, that it will eaſily take fire; then being ſet on fire in an open place, they let it burn ſo long, till by taking out a little for trial it appeareth, when cold, to be of a ſufficient conſiſtence; and then by covering the kettle the fire is extinguiſhed, and ſo pitch is made in a ſhort time.

“ There is a way to make roſin alſo out of the ſame knots, by ſplitting them out into thin pieces, and then boiling them in water: the roſin will boil out, and gather together into a body, and will become a pure hard roſin, when it is cold.”

Sir ROBERT MORAY promiſed to procure an account of the manner of making tar in Sweden.

Mr. BRERETON was deſired to bring in Mr. WINTHROP's account of the making of pot-aſhes.

The amanuenſis was ordered to write an account of the particularities of his diving under water in Sweden.

July 23. Mr. BOYLE preſident.

The amanuenſis was ordered to deliver in his account of diving at the next meeting.

Mr. BOYLE related his having extracted the air out of water in a tube, which let the water fall.

The amanuenſis was ordered to tranſlate from the French Monſieur HUYGENS's letter to Sir ROBERT MORAY, dated at the Hague July 14, 1662, N. S. containing ſome objections to ſome parts of Mr. BOYLE's *Defence of the doctrine touching the ſpring of the air againſt* FRANCISCUS LINUS *and Mr.* HOBBES.

July 30. The lord viſcount BROUNCKER preſident.

The tranſlation of Monſieur HUYGENS's letter of July 14, 1662, to Sir ROBERT MORAY by the amanuenſis, was read by him, and ordered to be entered in the letter book[m].

Mr. BOYLE's letter to Sir ROBERT MORAY in anſwer to the objections of Monſieur HUYGENS in his letter above-mentioned, was read, and ordered to be regiſtered[n], with another on the ſame ſubject written to Mr. BOYLE himſelf; who was deſired to add theſe two letters to his book, when it ſhould be reprinted.

The operator was ordered to carry Mr BOYLE's engine to Mr. OLDFIELD, in order to make the top of the cylinder of it and the ſucker to meet together.

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[m] Vol. i. p. 33.

[n] Ibid. p. 39.

Dr. **Goddard** was deſired to communicate the receit of the *aurum muſicum*, left with him by Mr. **Balle**; which the doctor immediately did, and it was ordered to be regiſtered [*], and is as follows:

"Take of ſal armoniac and ſulphur, of each one pound; of mercury, two pounds; melt one pound of block-tin, and caſt the mercury therein; then the ſalt, then the ſulphur, and grind all theſe on a ſtone: then put all theſe into an earthen pot or glaſs well luted or glued. Stop all the mouth but a little hole: or with a blind-head and a hole at the top ſo big as the top of the little finger may go in, and that no bigger, which leave open. Lute the head well on, and the body well luted, ſet them thus down in a ſubliming furnace, bearing it up with an iron bar, that the head may be above the furnace; and lute the furnace-mouth over with horſe-dung and clay, leaving vent-holes for the ſmoke and fire. Then put in fire, and when it is well fired, that the coals be all red, increaſe the fire for three hours and look that the hole in the top of the glaſs be not ſtopped with vapour: if it be, open it, and ſo increaſe the fire till no vapour comes out: then it is enough; ceaſe the fire, and let it cool gently, and carefully take off the head from the body, and you ſhall ſee the pure matter hang in a ring about the neck of the glaſs as ſoft as butter. This is the beſt and trueſt way of making *aurum muſicum*.

"To make it fit for the uſe you deſire, which is to make a braſs or copper-colour on plaiſter ſtatues. Take the *aurum muſicum*, and grind it well on a painter's ſtone, ſo that all the grit and hard knobs be made ſmall not to be felt: then grind it with fat linſeed oil, ſuch as is clarified in the ſun; and having firſt primed the ſtatue with half umber and the other half yellow oker ground well, and laid on in oil, and being dry, work the thinner over it, and when it is dry, it will look like braſs, and continue, if well wrought, an hundred years and more. If you will have it like copper, let the primage be two parts yellow oker, and one part red oker, with a little vermillion. If you will have it like an old braſs ſtatue, take a little verdigreaſe, or verditer, and grind it with the firſt primer, and it will have a glowing green, as you ſhall ſee in old ordnance or braſs ſtatues.

"This was done to two emperor's heads above thirty years ago, and they look, being waſhed over, as freſh and as fine, as if they had been done but yeſterday."

Mr. **Wilde** was deſired to bring his picture or image covered with *aurum muſicum* to the next meeting.

The amanuenſis was ordered to provide the long glaſs tube.

Mr. **Evelyn** was deſired to write to Mr. **John Beale** concerning the matter of fact of ingrafting cocks-ſpurs on the heads of the fowl.

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[*] Regiſter-book, vol. i. p. 184.

Auguſt 6. Mr. Wilde brought in a piece of ***aurum muſicum***; and was deſired to communicate his method of laying leaf-copper without tarniſhing.

It was ordered, that Mr. Bond be added to the committee for trying the variation of the needle at Whitehall:

That the diving engine be prepared for uſe by the operator and amanuenſis: And

That Dr. Pope and Mr. Hill conſult the writers on the *Aquæ ſolventes*.

Dr. Charlton was deſired to give in writing the account of the boy killed by lightning.

Dr. Goddard brought in an account of his ***Experiments of weighing glaſs canes with the cylinders of quickſilver in them, according to the Torricellian experiment***; which was ordered to be regiſtered [p].

Auguſt 13. It was ordered, that the particulars of the experiments propoſed, and not performed, be laid before the chair at the next meeting.

Dr. Charlton read his account of the boy killed with lightning; which was ordered to be filed up.

Mr. Packer ſubſcribed his name.

Dr. Goddard made an experiment with quickſilver, weighing it in the tube inverted.

The letters patents for the incorporation of this ſociety were read by Mr. Oldenburg; and it was voted,

That the preſident attended by the council, and as many of the ſociety as can be obtained, ſhould wait upon the king, after his coming from Hampton-Court to London, to give him humble thanks for his grace and favour: and that in the mean time the preſident ſhould acquaint his majeſty with their intention: and that afterwards the lord chancellor be thanked likewiſe, as alſo Sir Robert Moray, for his concern and care in promoting the conſtitution of the ſociety into a corporation.

Dr. Wallis was deſired to bring in writing his ſolution of Dr. Goddard's experiment of weighing glaſs canes with the cylinders of quickſilver ſtanding in them, according to the Torricellian experiment.

Auguſt 20. Dr. Wallis's written diſcourſe about Dr. Goddard's experiment was delivered in; but becauſe the underſtanding thereof depended greatly upon the ſchemes annexed to it, the reading of it was deferred till the next meeting: and the amanuenſis was ordered to draw the ſaid ſchemes in great upon a large paper, that every member might look upon them with conveniency.

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[p] Regiſter book, vol. i. p. 185. See Dr. Wallis's Mechanica, par. iii. cap. 14. propoſ. 7, 8. Oxon. 1671. in 4to.

Sir Robert Moray preſented to the ſociety two manuſcripts compoſed by two gentlemen of Scotland; the one treating of natural philoſophy, and written by Mr. Sinclair; the other, entituled *Optica Britannica*[q], written by Mr. James Gregory. The former was referred to the peruſal and conſideration of the lord viſcount Brouncker, Sir Robert Moray, Mr. Boyle, and Dr. Goddard; and the latter to Dr. Whistler, Dr. Pope, and Mr. Croune.

Mr. Hill and Mr. Croune were deſired to bring in an account of the tenacity of bodies out of Galileo and Merſennus; And

Mr. Palmer to ſpeak to Mr. Gregory the artiſt, about the new way of tinging ſtuffs.

It was ordered, that a copy of the experiments ſent by Mr. Croune to Dr. Power be given to Mr. Sinclair; and that he be deſired to make thoſe in Scotland, which relate to the weighing things in great depths under ground.

Mr. Boyle was deſired to proſecute the experiments about the velocity of ſounds, by great guns, to be procured by Sir Robert Moray for that purpoſe:

Dr. Goddard, Dr. Charlton, and Mr. Croune, to make experiments about echos: And

Dr. Charlton to inquire of Dr. Scarburgh concerning the account of ſounds, which he was formerly requeſted to communicate to the ſociety, whether they might expect it from him.

Mr. Powle was directed to be written to by Mr. Oldenburg, that he would ſend the ſociety an exact deſcription of the whiſpering place in the cathedral of Glouceſter.

Mr. Boyle was requeſted to remember the proſecution of his experiments concerning colours and their various productions by mixture:

Mr. Evelyn to ſpeak to Col. Blount concerning his obſervations about the menſuration of ways:

Mr. Oldenburg to peruſe Ricciolus[r] concerning the menſuration of the earth; and to compare what that author hath ſaid of the ſeveral methods thereof in his *Almageſtum*[s] with what he hath ſaid in his *Geographia* and *Hydrographia*[t]: And

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[q] It was printed at London in 1663 under the title of *Optica promota*.

[r] John Baptista Ricciolus of Ferrara, a jeſuit, profeſſor of philoſophy and ſchool divinity at Parma and Bologna.

Mr. Boyle to bring his experiment, about the duck in the pneumatical engine, to the next meeting.

The amanuenſis was ordered to tranſlate into Engliſh, from the French, Monſieur Huygens's letter to Sir Robert Moray, dated from the Hague the 18th of Auguſt, N. S. relating to Mr. Hobbes's duplication of the cube and quadrature of the circle, as alſo the height of the atmoſphere; and to bring the ſaid tranſlation to the next meeting.

Auguſt 27. Dr. Wallis's account of Dr. Goddard's experiment of weighing mercurial glaſs canes was read, and ordered to be regiſtered[u], and afterwards publiſhed by him[w].

Dr. Goddard propoſed the experiment of what force will compreſs the air into leſs dimenſions, and in what proportion.

Sir Robert Moray propoſed to inquire by experiments, what bore maketh a jet of water riſe higheſt; and of what figure the end of the pipe muſt be for that purpoſe; alledging, that the end of the pipe being tapered, by that figure the cylinder of water incumbent on that bore preſſes more upon it, than by its own weight.

Dr. Wren was deſired to peruſe the earl of Sandwich's obſervations made by him in his late voyage to Portugal and the Straits, and to compare them with thoſe made here of the ſame kind.

It was ordered, that the earl of Sandwich ſhould have the thanks of the ſociety given him by Sir Paul Neile, for his care and favour in making and communicating theſe obſervations; concerning which he ſhould receive a farther account hereafter.

Mr. Croune was deſired to make the experiment of ſhewing, that water will paſs where air will not.

Upon the occaſion of the manuſcript philoſophical books, which were preſented to the ſociety for their examination, and received a good character from thoſe members, who had read them, it was ordered, that no books preſented to the cenſure of the ſociety ſhall receive a public approbation from them; but only, if the ſociety think fit to refer ſuch books to one or more of the fellows, eſteemed by them competent judges thereof, that the report made thereof to the ſociety by ſuch fellows, may be communicated to the authors of the books thus preſented; and that it may be ſigned by one of the ſecretaries.

Auguſt 29. In the afternoon of this day[x] the preſident and council, with other members of the ſociety, waited on the king, to return him the thanks of the ſociety for the patent of their eſtabliſhment: upon which occaſion the preſident made the following ſpeech to his majeſty[y]:

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[s] Printed at Bologna in 1651.

[t] Printed at Bologna in 1661.

[u] Regiſter-book, vol. i. p. 187.

[w] Mechanica, part 3.

[x] MS. of Dr. John Pell.

“ May it pleaſe your Majeſty,

“ We your majeſty's moſt loyal ſubjects, newly incorporated by your majeſty's charter, and honoured with the name of the Royal Society, do with all humility preſent ourſelves before your majeſty, the royal founder thereof, to offer you our moſt hearty thanks, as the only way we have at preſent to expreſs our deep ſenſe of your majeſty's grace and favour to us, and to aſſure your majeſty of our conſtant veneration for your ſacred perſon, our devotion to your majeſty's ſervice, and our firm reſolution to purſue ſincerely and unanimouſly the end, for which your majeſty hath founded this ſociety, the advancement of the knowledge of natural things, and all uſeful arts, by experiments: A deſign, Sir, that is deſervedly accounted great and glorious, and is univerſally reputed to be of that advantage to mankind, that your majeſty is highly admired and extolled for ſetting it on foot; and this ſociety is already taken notice of, and famous throughout all the learned parts of Europe; and doubtleſs in time will be much more by the continuance of your majeſty's gracious favour, and the happy ſucceſs of their endeavours, to the great increaſe of the fame of your majeſty's prudence, which hath juſtly intitled you to the honour of laying the firſt foundation of the greateſt improvement of learning and arts, that they are capable of, and which hath never heretofore been attempted by any: ſo that men cannot now complain, that the favour and aſſiſtance of a potent monarch is wanting to this long-wiſhed for enterpriſe.

“ And, Sir, our aſſurance of this your majeſty's favour and aſſiſtance is that, which gives vigour to our reſolutions, and is the life of our hopes, that in due ſeaſon we ſhall be able to make your majeſty an acceptable preſent of choice and uſeful experiments, and accompliſh your great deſign, being thereto engaged by ſo many powerful motives.

“ And in the mean time we ſhall daily pray, that God will be eminently gracious to your majeſty, and accumulate upon you all the bleſſings anſwerable to the largneſs of your heart, the height of your condition, the weight of your charge, the multitude of your virtues, and the deſires and wiſhes of all your faithful ſubjects.”

The next day[z] they waited on the lord chancellor, to whom the preſident ſpoke as follows[a]:

“ My Lord,

“ All of us, whom your lordſhip hath thought fit to be members of the Royal Society, are come ſolemnly to acknowledge your lordſhip's favour to us, and to preſent our thanks, together with an aſſurance of our readineſs to ſerve your

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[y] Supplement to the letter-books, vol. i. p. 141.

[z] MS. of Dr. Pell.

[a] Supplement, *ubi ſupra*, p. 145.

“ lordſhip upon all occaſions, and of our deſires to contribute the beſt we can to the greatneſs of your name, which is already far more illuſtrious than that of a learned predeceſſor of yours, a great and renowned chancellor of England [b], who is famous for having but pointed at that improvement of ſolid learning, which is now by your hand ſo vigorouſly and effectually carried on.

“ My lord, We are ſenſible of the importance of that duty now incumbent on us, to purſue diligently the ends, for which our ſociety is conſtituted; and hope that our endeavours ſhall, by God's bleſſing, become ſucceſsful for the honour of the king, the royal founder of this ſociety, and of your lordſhip, our noble patron, as well as for the good, not only of his majeſty's kingdoms, but of all mankind, and ſuitable to the great expectations of the learned abroad, who are already pleaſed to take notice of us. And the continuance of your lordſhip's favour to us will both ſtrengthen our confidence, and quicken our endeavours, and withal give us cauſe to glory daily more and more in thoſe vows, by which we have dedicated ourſelves to your lordſhip's ſervice.”.

September 3. At the meeting of the ſociety, it was referred to Dr. WREN to take care of making the ſeveral experiments mentioned at the laſt meeting concerning the *aquæ ſalientes*.

The requeſt of the ſociety made at the laſt meeting to Dr. WREN about comparing the earl of SANDWICH's experiments, was continued: but it being a buſineſs of difficulty and much calculation, required more time than he could yet obtain from his other employments.

The deſire of the laſt meeting to Mr. CROUNE was continued.

The tranſlation of Monſieur HUYGENS's letter of the 18th of May was read, and ordered to be filed up [c].

The preſident gave an account to the ſociety of his and the council's addreſs to the king in the name of the ſociety, to return their humble thanks to his majeſty for his favour in eſtabliſhing them into a corporation by his letters patents; with his majeſty's anſwer of his peculiar eſteem of the ſociety, and his readineſs to give them all due encouragement: as likewiſe of their addreſs of thanks to the lord chancellor for his readineſs to further that buſineſs; by whom they were very favourably received, and aſſured, that it was his purpoſe to come himſelf to the ſociety to expreſs his acknowledgments to them.

The lord viſcount BROUNCKER was deſired to deliver in a copy of the ſpeech, which he made to his majeſty, and of that to the lord chancellor, in the name of the ſociety.

A Latin letter from JOHN FREDERIC GRONOVIUS, one of the profeſſors at Leyden, to Mr. HAAK, dated at Leyden, Auguſt 18, 1662, expreſſing his high ſenſe of the uſefulneſs of the deſign of the ſociety, was read, and ordered to be entered in the letter-book[d].

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[b] Lord BACON, viſcount VERULAM.

[c] The original is entered into the letter-book, vol. i. p. 64.

Sir Gilbert Talbot, Dr. Merret, Mr. Haak, and Mr. Henshaw were deſired to aſſiſt in the tranſlation of the Italian book about dying.

A manuſcript diſcourſe in French about taking heights and diſtances by a new way of catoptrics, was communicated by Sir Robert Moray, and ordered to be tranſlated againſt the next meeting.

Several experiments for improving huſbandry by ſteeping ſeeds in ſalt liquors, were brought in by Sir Robert Moray.

The bloody pond at Newington being diſcourſed of, it was ſuggeſted, that the appearance of it might be occaſioned by a multitude of little worms, which upon their ſinking down might cauſe the water to change the colour; theſe worms being viſible in ſome ponds. Others conceived, that the colour might ariſe from ſome peculiar quality in the earth by an exudation from it, whence appear on the ſurface of the water ſometimes green and ſometimes red ſpots.

Dr. Goddard's experiment about the weighing of the quickſilver tube was tried; and he was deſired to bring an account of it in writing to the next meeting.

September 10. Mersennus's account of the tenacity of cylindrical bodies was read by Mr. Croune, to whom the proſecution of that matter by conſulting Galileo was referred, when the tranſlation of that Italian treatiſe, wherein Galileo treats of that ſubject, ſhall be printed.

It was ordered, that at the next meeting experiments ſhould be made with wires of ſeveral kinds of the ſame ſize, *viz.* ſilver, copper, iron, *&c.* to ſee what weight would break them; Mr. Croune being appointed curator of this experiment.

The reading of the French manuſcript, brought in by Sir Robert Moray, about taking the heights and diſtances by catoptrics, was deferred till the deſcription of the inſtrument ſhould come.

Dr. Goddard made an experiment concerning the force, which preſſeth the air into leſs dimenſions; and it was found, that 12 ounces contracted $\frac{1}{14}$ part of air.

The lord viſcount Brouncker was deſired to ſend his glaſs to Dr. Goddard, to make farther experiments about the force of preſſing the air into leſs dimenſions.

Dr. Wren was reminded of proſecuting Mr. Rooke's obſervations concerning the motions of the ſatellites of Jupiter.

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[d] Vol. i. p. 44.

Dr. CHARLTON read an eſſay of his concerning the velocity of ſounds, direct and reflex; and was deſired to proſecute the ſubject, and to bring his diſcourſe to the next meeting, in order to its being regiſtered.

Dr. GODDARD made the experiment to ſhew how much air a man's lungs may hold, by ſucking up water into a ſeparating glaſs after the lungs have been well emptied of air. Several members of the ſociety trying it, ſome ſucked up in one ſuction about three pints of water, one ſix, another eight pints and three quarters, *&c.* And it was obſerved what a variety there was of whiſtles or tones, made by the water at the ſeveral heights, in falling out of the glaſs again.

The account of zoophytal or animal ingraftings, received by Mr. EVELYN from a friend of his, was communicated by him, and regiſtered[e], as follows:

> “When my wife, ſays he, cuts the cocks for capons by plucking the feathers, “and applying them warm in an inciſion of the comb; and there holding them “under her finger for ſome minutes, till the gore-blood hath well cemented “them, they grow without fail. Thus can ſhe make any bright purple or other “beautiful feather grow in the place of the creſt. By the ſame addreſs will the “ſpur, taken freſh and warm from the heel of the cock, be made to grow in the “place of the comb alſo.”

It was diſcourſed, whether there be any ſex in trees and plants. Some inſtances were brought of palm-trees, plum-trees, hollies, aſh trees, quinces, pionies, *&c.* wherein a difference was ſaid to be found in their bearing of fruit, or in their hardneſs and ſoftneſs, or medicinal operations. It was remarked by ſome, that the difference, which is obſerved in trees with reſpect to fertility or ſterility, may be produced by ingrafting. Sir ROBERT MORAY mentioned a French gentleman, who having been ſome time before in England, and being preſent at a meeting of the ſociety, took notice, that the nature of all trees is to run altogether to wood; which was changed by a certain method of cutting them, whereby they were made, contrary to their nature, to bear fruit; and that according as this cutting was performed with more or leſs ſkill, the more or leſs fruitful the tree would be.

A propoſition was offered by Sir ROBERT MORAY about the planting of timber in England, and the preſerving of what was then growing.

Mr. BOYLE ſhewed a puppy in a certain liquor, in which it had been preſerved during all the hot months of the ſummer, though in a broken and unſealed glaſs.

Sir JAMES SHAEN, knt. was propoſed as a candidate by Sir ROBERT MORAY.

September 17. Mr. HILL gave an account of an experiment made with the ball and plummet, for the meaſuring of the depth of the ſea, by Mr. BALLE; in which the ſociety conceiving there was ſome miſtake, Mr. HILL was deſired to write to him again for a more particular and exact account.

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[e] Regiſter-book, vol. ii. p. 34.

Sir Francis Fane, knight of the Bath, and Christopher Terne, M. D. were propoſed as candidates by Mr. Croune.

Mr. Croune ſhewed the experiment recommended to him, of a bladder filled with water hung in the air, through all the pores of which was an exudation of water in ſmall drops; a proof, that water will paſs where air will not. The bladder was old and dried.

Mr. Boyle was deſired to communicate to the next meeting the experiment of two liquors, which by mixture immediately became a conſiſtent body.

Dr. Charlton read his diſcourſe, entituled *Apparatus Phonocampticus: or, what inquiries are principally to be made by ſuch, who would attain to the certain knowledge of the nature of echos:* which was ordered to be entered into the book of hiſtories and theories[f].

The operator was ordered to provide a thick glaſs tube about ſix feet long, for trying the experiment of quickſilver and water together at the next meeting.

Dr. Charlton was deſired to procure againſt the next meeting ſome of the Portugal-water; and Mr. Hill ſome of the water brought by the merchants from the Indies, to be compared with ſome of our water, with reſpect to their ſeveral weights.

A paper about the improvement and planting of timber, brought by Sir Robert Moray from the commiſſioners of his majeſty's navy, was read, and referred to the conſideration of Mr. Evelyn, Dr. Goddard, Dr. Merret, and Mr. Winthrop.

The preſident communicated a letter ſent by his majeſty to the duke of Ormonde, lord lieutenant of Ireland, recommending the Royal Society for a liberal contribution from the adventurers and officers of Ireland, for the better encouragement of the ſaid ſociety in their deſigns. Whereupon it was ordered, that a copy of the ſaid letter ſhould be taken[g]; and the humble thanks of the ſociety be returned to his majeſty by Sir Robert Moray, for this great teſtimony of his royal favour.

The preſident was deſired to return likewiſe the thanks of the ſociety to Mr. Secretary Nicholas and Mr. Williamson, for their readineſs to aſſiſt the ſociety in the king's letters to Ireland, without taking fees.

The experiment of breaking a wire, by weights hanging upon it, was tried.

Mr. Winde, Dr. Cudworth, Dr. More, commiſſioner Pett, Mr. Schroter, Mr. Hayes, Sir James Shaen, and Mr. Isaac Barrow, were put to the ſcrutiny; and elected.

[f] Regiſter-book, vol. i. p. 197. [g] The copy of this letter was wanting in Mr. Oldenburg's time, as appears from a note in his hand-writing upon a catalogue of the papers referred to in the firſt journal-book.

September 24. Sir JAMES SHAEN and Monſieur SCHROTER were admitted as fellows of the ſociety.

Dr. GODDARD gave an account in writing of his experiments of weighing the mercurial glaſs canes; which was ordered to be regiſtered[h].

He brought in likewiſe his thoughts concerning the planting of timber in England, upon the propoſition offered to the conſideration of the ſociety by the commiſſioners of his majeſty's navy.

Dr. ENT obſerved, that it was found by experience, that no oaks grow well but from acorns.

Mr. WINTHROP read his paper concerning the conveniency of building of ſhips in ſome of the northern parts of America; which was ordered to be regiſtered[i], and was as follows:

“ The honourable ſociety may be pleaſed to conſider, whether it may not be fit to propoſe to his majeſty, or his honourable commiſſioners for the navy, the conveniency of building ſhips in ſome of the northern parts of America; there being ſeveral reaſons, that may be propounded, as motives encouraging thereunto.

1. “ That there is great ſtore of good oak timber, fit for the building of ſhips, in many parts of that continent.

2. “ There is great ſtore of ſpruce and fir-trees, fit for maſts of all ſizes for ſhips of any burthen.

3. “ There is ſtore of that ſort of pine, which is called pitch-pine; of which tar and pitch may be made.

4. “ There are many ſaw-mills, for the ſawing of plank and board of all ſorts; ſo that there may be a ſufficient quantity at all times provided, though there ſhould be divers ſhips built at a time.

5. “ In reſpect of the cheapneſs of timber, and by the help of thoſe ſaw-mills, which are moſt of them upon or near good harbours and navigable rivers, plank will be much cheaper than it can be provided in England; poſſibly for a third or fourth part of the price.

6. “ It is not a new project the building of ſhipping in thoſe parts, for there hath been ſufficient experience already made, there having been every year ſome built (great or ſmall) for above theſe twenty years. There were this ſummer divers here at London, that were built there, whereof two of about two hundred tuns: there is one now of an hundred tuns in this river, that was built there: there

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[h] It does not appear in the regiſter. [i] Regiſter book, vol. i. p. 205.

" have been formerly ſome of three hundred and four hundred tuns built there.
" There hath been alſo, and is daily, tar and pitch made; and much experience
" hath been made of the maſts of thoſe parts; many having been brought over
" hither and made uſe of.

7. " There may be yet farther trial made without much trouble, or unneceſ-
" ſary or hazardous charge, there being already very good artiſts for maſter-
" workmen, and other ordinary workmen, for building of ſhips, known well to
" many here; alſo calkers, and ſmiths, and all other trades, neceſſary towards
" that work.

8. " When the ſhip is built, it may be preſently freighted with planks, boards,
" knee-timber, or other timber, and trunnels, or with excellent maſts; all which
" will be of good uſe for ſupply of building ſhips here.

9. " When it ſhall be thought fit to ſend over more workmen, there are houſes
" may be hired or bought at reaſonable prices, or other private lodgings, for their
" entertainment, in ſeveral parts of the country; and plenty of all ſorts of pro-
" viſions, for the ſupply of as many as it may be neceſſary to employ, to be
" bought at indifferent rates. Such things, as are neceſſary to be tranſported hence
" toward the buſineſs, are only rigging, ſails, anchors, cables, and Spaniſh iron
" for ſpikes, bolts, *&c.* which is beſt to be here alſo ready made into bolts and
" other iron-work neceſſary. Though there be iron-works, and good iron made
" there, yet Spaniſh iron is moſt approved for that work."

Dr. CHARLTON brought ſome of the Portugal water; which was ordered to be kept till ſome water could alſo be procured from the Eaſt-Indies, that they might be compared with ſome of our waters, as to their weights.

Dr. GODDARD ſuggeſted, that it might be tried, whether the water carried over-ſea in glaſs-veſſels will putrefy, as it doth in wooden ones. The care of this experiment was recommended to Mr. HILL.

Dr. GODDARD was deſired to try, at the next meeting, the experiment of quickſilver and water together in a glaſs cane of five or ſix feet long.

The experiment of breaking, by weight, a ſilver wire of $\frac{1}{6}$ of an inch diameter, was tried; but there being a defect in the apparatus, order was given to the operator to get it mended againſt the next meeting, that it might be then tried again.

October 1. FRANCIS WILLUGHBY, eſq; was admitted member of the ſociety.

Sir FRANCIS FANE was elected and admitted.

Mr. BOYLE ſhewed an experiment of two limpid liquors, which mixed together ſoon coagulated into a conſiſtent body. He ſaid, that one of the liquors was

ſpirit

ſpirit of wine, the other no ſpirit. He was deſired to proſecute his experiment about coagulation; as alſo thoſe concerning the nature of colours.

Mr. Willughby ſhewed a ſnake's egg; which, being opened, a ſnake was taken out of it, with a kind of navel faſtened to a piece of fleſh like a placenta, and two little protuberant parts near its tail, taken by ſome for a *geminus penis*.

Upon this occaſion it was remarked, that the difference between the brooding of ſnakes and that of vipers was, that the former lay their eggs in dunghils, by the heat of which they are brooded; but the latter brood their eggs within their bellies, and bring forth live vipers. A member of the ſociety added, that he had ſeen a ſnake lie upon his eggs in the manner, that an hen ſits upon hers.

Dr. Wren preſented ſome cuts done by himſelf in a new way of etching; whereby, he ſaid, he could almoſt as ſoon do a piece on a plate of braſs, as another ſhould draw it with a crayon upon paper.

Dr. Merret read his paper concerning the planting and preſerving of timber; together with his collection of thoſe ſtatutes, that have been formerly made by the parliament of England concerning the ſame.

Dr. Ent ſuggeſted, that ſets of trees cut near the root, and then tranſplanted, will thrive very well, without obſerving their poſition as to north or ſouth.

Dr. Wren obſerved, that the grafting of a root upon a tree, and ſo ſetting it within the ground, makes it thrive very well.

Mr. Hill was deſired to procure, that ſome Engliſh water might be ſent in glaſs bottles into the Eaſt-Indies, to ſee whether it would putrefy in glaſs as well as it does in wooden veſſels.

Mr. Evelyn was deſired to peruſe the papers concerning the propagating of timber, brought in by Dr. Goddard, Dr. Merret, and Mr. Winthrop, and to add what he had of his own, digeſting the ſum of all into one paper againſt the next meeting.

The experiment of breaking a ſilver wire of $\frac{1}{8}$ of an inch diameter being made, and the wire broken by the weight of 850 lb (whereof the ſcale, wherein the weight lay, was reckoned for 100 lb) it was ordered, that the operator provide, againſt the next meeting, a wire of $\frac{1}{16}$ of an inch diameter; and that the experiment be tried as well in iron and braſs wires as in ſilver ones.

The experiment of lifting up bellows under water was made; and Dr. Goddard, Dr. Whistler, and Dr. Wren, were deſired to proſecute the ſame.

Dr. Wilkins propoſed the experiment of ſinking a lamp in a glaſs-veſſel under water, to ſee how long it will burn there.

Dr. WREN propoſed the experiment of forcing up water in two pipes of different diameters and equal altitudes; but having both in the lower end equal bores, the water in the larger pipe would be forced out by leſs ſtrength than that in the ſmaller pipe. He was deſired to bring in a deſcription of this experiment, and ſomething by way of account concerning it, at the next meeting.

October 8. Mr. JAMES HAYES was admitted a member of the ſociety.

Mr. PETTY propoſed WILLIAM HOARE, M.D. as a candidate.

Dr. TERNE was put to the ſcrutiny, and unanimouſly elected.

Dr. GODDARD and Dr. WILKINS were appointed curators, for the experiment propoſed at the laſt meeting, how long a lamp will continue to burn under water.

Mr. WILLUGHBY produced his demonſtration to prove, that the ſame area of ground planted with trees after a quincuncial figure, will hold more trees placed at the ſame diſtance from one another, than the ſquare, in the proportion of 8 to 7.

It was ordered, that the thanks of the ſociety be given to Dr. MERRET, for his pains in tranſlating the Italian diſcourſe *De Arte Vitrariâ*, upon the motion and deſire of the ſociety: And

That Mr. WILDE be deſired to communicate to the ſociety ſuch choice diſcourſes, as he hath collected upon ſeveral ſubjects relating to experimental philoſophy, that they may be peruſed and conſidered by ſeveral members of the ſociety to be appointed for that purpoſe.

Mr. BOYLE was deſired to ſhew, at the next meeting, the ſecond part of his experiment about coagulation, *viz.* the reducing the coagulated liquors to their former fluidity.

It was debated and put to the queſtion, whether the former order concerning admitting all perſons of the degree of barons or above it, and all of his majeſty's privy-council, upon their deſire and ſubſcription, without putting them to the ſcrutiny, ſhould be continued and made a ſtatute; and it paſſed in the affirmative, twenty one members and more being preſent.

Dr. WREN offered an experiment about the undulation of quickſilver in a crooked tube; which, he ſuggeſted, was, for the velocity of it, proportionable to the vibrations of a pendulum. He was deſired to proſecute that experiment farther, and to give in an account of it.

The experiment of breaking wires was deferred till the next meeting.

Mr. OLDENBURG produced a letter, dated at Zurich, 17 Sept. 1662, giving an account of a new mixture of metals very uſeful for piſtols and guns, highly eſteemed in Germany, extremely light, and not ſubject to ruſting or breaking. The following extract of this letter was ordered to be entered in the letter-book [k].

“ Here is a goldſmith, called Felix Warder, citizen of Zurich, who hath the invention of a way to make hand-guns and piſtols, of a metal, which is called *orichalcum*. None beſides himſelf is known to have this invention; and he tells me, that at Nuremberg they have ſpent thouſands in making experiments to find it out, but all in vain. He can make that brittle metal ſo tough, that that it is a great deal freer from the danger of breaking than iron: beſides, the piſtols and guns made of it are ſo thin and ſo light, that they weigh ſcarcely half the weight of iron ones, and will bear a double charge, without ever breaking or cracking. The grandees have been preſented with theſe guns frequently, and he ſells the leaſt of theſe piſtols for ſix doublons a pair; the larger ſort, being gilt, for twelve doublons or Spaniſh piſtoles. I have diſcourſed with him about the preparing this metal: all I can learn of him is this, that he adds ſomething to the *orichalcum*, which maketh it fuſible and tough. And the barrels of his piſtols and guns are all caſt, and then prepared for uſe, when they are ſcowered within and without. I did aſk him, whether he was not willing to teach the art to any? He ſaid he was, though he had taught it nobody yet but his daughter, now dead, who was wont to help him to make them, when he had ſo much work, that he could not diſpatch it all alone. I enquired further, what his price would be for teaching it? He ſaid, if any, to whom he ſhould teach, it would bind him to teach none elſe, his price would be 200 doublons; but if it were left free to him to teach others, he would ſell it for half that money. He added, that the invention could not be taught in writing, but that ſuch, as would purchaſe it, muſt be preſent to ſee all themſelves what is done, becauſe that, beſides the ingredients and the ordering of them, there is a certain ſlight, which if not ſeen and well obſerved, the work will miſcarry.”

October 15. Mr. Willughby produced a whiting's head, to ſhew, that there was a moveable ſkin over the eye, anſwerable to what Mr. Henshaw ſhewed at the laſt meeting in a ſnake's ſkin, in which there were two little concave and convex glaſſes, in the place of the eyes caſt off with the reſt of the ſkin, affixed to it in the due place.

Sir Robert Moray gave an account of his majeſty's favour to the ſociety, in declaring his pleaſure, that no patent ſhould paſs for any philoſophical or mechanical invention, but what was firſt put to the examination of the ſociety.

He mentioned likewiſe a propoſal likely to be ſpeedily referred to them, of making iron with ſea-coal. And having formerly been engaged himſelf in that experiment of making iron with ſea-coal, he declared his judgment, that he conceived the attempt not feaſible, on account, as he ſuppoſed, of the abundance of ſulphur in the ſea-coal, which deſtroys that quality in iron, which renders it tenacious.

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[k] Vol. i. p. 45.

The debate on this ſubject was adjourned till the perſon himſelf, who undertook the deſign, had made his trial.

Dr. Hoare was put to the ſcrutiny and elected.

Mr. Evelyn read his paper, in which he had put together the ſeveral ſuggeſtions offered by others in diſtinct papers, by way of anſwer to the queries of the commiſſioners of the navy; together with his own obſervations and apprehenſions concerning the propagation of timber-trees; and he was deſired to print the paper read by him [1].

The experiment of breaking wires was proſecuted, and referred to a farther trial; and Dr. Goddard was deſired to bring in an account of it to be regiſtered.

Dr. Goddard, Dr. Merret, Mr. Evelyn, and Dr. Wilkins, were appointed a committee, to make an extract out of Mr. Evelyn's papers, and the others, *&c.* in order to return a brief and methodical anſwer to the queries of the commiſſioners of the navy.

October 22. Dr. Charlton produced the under-jaw of a pike of four feet two inches long, having every other tooth moveable, which he conceived was for more eaſy deglutition. He was deſired to take notice of others, and to conſider likewiſe the whole nature of ſwallowing. Upon this occaſion he ſuggeſted, that thoſe voracious animals which ſwallow others whole, do not kill them firſt, but ſwallow them alive; inſtancing in the cormorant, that never is ſeen to ſwallow any but live fiſhes; and in vipers, that ſwallow only live frogs or toads: and conjecturing, that the motion of the live creature makes it paſs more eaſily. He ſuggeſted likewiſe, that no animal can ſwallow under water without being choaked.

Dr. Terne was admitted fellow of the ſociety.

Dr. Merret mentioned, that live worms are ſometimes found in the ſtomachs and guts of ſalmons. He was deſired to make ſome obſervations in thoſe and other fiſhes.

This gave occaſion of diſcourſing upon what is called equivocal generation; and it was conſidered, whether all animals, as well vermin and inſects as others, are produced by certain ſeminal principles, determined to bring forth ſuch and no other kinds. Some of the members conceived, that where the animal itſelf does not immediately furniſh the ſeed, there may be ſuch ſeeds, or ſomething analagous to them, diſperſed through the air, and conveyed to ſuch matter as is fit and diſpoſed to ferment with it, for the production of this or that kind of animal. Others thought, that thoſe *ſemina*, ſaid to be carried in the air, would have their ſeminal virtue impaired, if not deſtroyed, by it. Sir **Robert Moray** ſuggeſted, that ſomething from without concurred to this kind of generation, ſince ſhips, when ſheathed, are thereby ſecured from rotting and breeding of worms.

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[1] It was publiſhed by him under the title of, *Sylva: Or, A Diſcourſe of Foreſt-trees, and the Propagation of Timber in his Majeſty's Dominions, as it was delivered in the Royal Society the 15th of October*, 1662. It has paſſed through five editions in folio, the laſt of which appeared in 1729.

It was reſolved, that farther inquiry ſhould be made into this matter in due ſeaſon; and that the ſeveral experiments ſhould be tried, of putting blood, fleſh, brains, *&c.* together in a glaſs or other proper veſſel; as alſo bran and meal; and likewiſe cheeſe moiſtened with ſack, *&c.* and that Dr. **Merret**, Dr. **Glisson**, and Dr. **Charlton**, ſhould be deſired to be curators of theſe experiments.

Dr. **Merret** was deſired to bring in his *Materia Vitraria*, mentioned in the book tranſlated by him into Engliſh from Italian.

Dr. **Charlton** brought in his papers, in which he had reduced birds into certain families, in Latin and Engliſh; which papers were ordered to be kept; and the doctor was deſired, in conjunction with Dr. **Merret**, to reduce fiſhes into the like claſſes.

Mr. **Evelyn** was deſired, againſt the next meeting, to make an extract of his diſcourſe concerning the planting and propagating of trees, in anſwer to the queries of the commiſſioners of the navy: And

Mr. **Croune** to be curator of the experiments of breaking wires, and to have them exactly drawn againſt the next meeting.

The operator was appointed to provide for the experiment of the burning of a lamp under water at the next meeting.

He acquainted the ſociety, that the bigger ſilver wire, which was of $\frac{1}{8}$ of an inch diameter, required the ſame weight to break it, when it was ſhorter by $1\frac{1}{2}$ foot than before.

Sir **Robert Moray** communicated a letter written from Paris, concerning a new method to heal cut nerves, tendons, and other membranous parts, by ſewing them together: as alſo a new way of curing hydroceles and hernias, preſerving the teſticles in their ſtrength, and without obliging the patients to carry truſſes.

October 29. Dr. **Wilkins** and Dr. **Goddard** gave an account of the experiment, which had been made of a lamp burning under water in a veſſel of four gallons, the ellychnium being one ſingle thread of cotton, and the lamp wholly under water: the flame laſted eleven minutes.

They were deſired to repeat the experiment ſeveral times; as alſo to try it with ſome live creatures.

Dr. Croone [m] gave an account of a ſilver wire of $\frac{1}{18}$ of an inch, breaking by one hundred, one quarter, and an half quarter weight, beſides the weight of the ſcale. He was deſired to proſecute the experiment, and to bring in the ſeveral trials thereof.

Mr. Isaac Barrow was admitted fellow.

Mr. Colwall commmnicated a paper concerning the manner of ordering oiſters at Colcheſter; which was ordered to be filed up.

The propoſition of making iron with ſea-coal being mentioned again, Sir Robert Moray added to what he had formerly ſaid about it, that the undertaker pretended to do it without charring the ſea-coal, and without a reverberating furnace, or any thing added to the coals: and that he thought, that the ſaid undertaker would do it by a furnace of a certain figure, whereby the fire ſhould be proportioned and regulated in ſuch a manner, as to produce the effect intended, *viz.* good iron ſerving for all purpoſes.

There was alſo mentioned a way of making lead by ſea-coal; the undertaker of which being ſaid to be at Windſor, and known to the amanuenſis, the latter was ordered to write to him about it.

Sir Robert Moray offered to the conſideration of the ſociety a way to compare the effect of heat and cold in rarefaction and condenſation of air, with that of force or weight. Upon which, Dr. Goddard ſuggeſted Drebbel's method of governing a furnace by a thermometer of quickſilver.

Dr. Goddard propoſed the third of his experiments, of weighing glaſs canes with the cylinder of mercury in them; which ſhewed, as he obſerved, that the tube and the quickſilver weighed as much, notwithſtanding the preſſure of the air, that ſhould put them *in æquilibrio*, as they would have done being weighed in a pair of ſcales apart. The lord viſcount Brouncker was deſired to give his thoughts upon it.

Dr. Wilkins was put in mind to proſecute his deſign of an *univerſal language.*

Mr. Schroter propoſed the experiment of breaking a ſerpentine ſtone by a ſpider; which he was deſired to ſhew at the next meeting.

The amanuenſis was ordered to give Sir Robert Moray a copy, both of the experiments and queries, formerly drawn up to be ſent to the Eaſt-Indies.

Dr. Wilkins mentioned Mr. Streete's propoſition of the longitude; and it was referred to the conſideration of ihe lord viſcount Brouncker and Sir Robert Moray, before it ſhould be preſented to his majeſty.

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[m] He was created doctor of phyſic at Cambridge, by the king's mandate, Oct. 7, 1662. Dr. Ward's Lives of the Profeſſors of Greſham college, p. 320.

Sir ROBERT MORAY mentioned, that there were ſome conſiderable papers of Mr. HARRIOT and Dr. HARVEY, which might be retrieved. And it was ordered, that thoſe of Mr. HARRIOT being in the poſſeſſion of the earl of CLARENDON, lord high chancellor, ſhould be inquired after by Mr. MATTHEW WREN, and thoſe of Dr. HARVEY by Dr. ENT and Dr. SCARBURGH.

November 5. Commiſſioner PETT and Mr. WINDE were admitted fellows.

Dr. CROUNE was deſired to give an account in writing, at the next meeting, of the experiments of wires.

Mr. HAAK intending a journey to Colcheſter, undertook to make farther inquiries about oiſters, and in particular about their ſpawning, multiplication in their pits, diſperſion of their ſpawn by the tides, *&c.*

A propoſition was made by a perſon introduced by the amanuenſis, of melting lead-ore with pit-coal, with leſs charge, and in a ſhorter time; yielding alſo a greater quantity of lead out of the ore than other methods do. It was thought proper, that he ſhould ſtate his propoſition in writing, and confer with the lord viſcount BROUNCKER and Sir ROBERT MORAY about it.

It was ſuggeſted, that Mr. POVEY might be deſired to ſend to Damaſcus, about the method uſed there of making ſteel.

Mr. COLWALL moved, that the inquiry concerning the ebbing and flowing about the iſland of St. Helena might be recommended to ſome perſons, who were going thither; and he was deſired to ſend it as it was ſtated by Mr. ROOKE.

The lord viſcount BROUNCKER brought in his ſolution of Dr. GODDARD's third mercurial experiment; and the amanuenſis was ordered to draw the figure of it in great, againſt the next meeting.

Mr. EVELYN having conferred with commiſſioner PETT concerning the account, which he was to bring in, of the beſt method of planting and propagating timber-trees, was deſired to haſten that part of it, which concerns the way of preparing acorns for planting.

Mr. POWLE's deſcription of the whiſpering-place in the cathedral of Glouceſter was brought in by Mr. OLDENBURG, and read; and the ſcheme of it was ordered to be drawn in great, againſt the next meeting; which Mr. WINDE undertook to do. The deſcription was as follows[a]:

" The cathedral in Glouceſter hath on either ſide the choir an iſle, and at the " upper end a very fine chapel, dedicated to the virgin Mary. Into this there is " an entrance behind the high altar, under a ſpacious arch, and over the arch ſtands

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[a] Original Regiſter, vol. i. p. 31.

“ another little chapel, or cell, conſecrated to one of the apoſtles. The iſles are
“ divided by arches of ſtone into two ſtories: from the floor to the uppermoſt of
“ theſe there is a narrow paſſage, leading behind the eaſtern window of the choir,
“ and by the ſide of this little chapel to the ſame floor of the other iſle. This
“ paſſage or entry, ſo famous by the name of the whiſpering-place, contains in
“ breadth about three foot, and in height 6¼, ſave only on the ſide adjoining to
“ the little chapel, where it riſeth to be eight foot and about four inches high:
“ the figure of it is the half of an irregular polygon, neither ſides nor angles cor-
“ reſponding to one another. It conſiſts wholly of free ſtone, the roof being co-
“ vered with a flat ſtone of the ſame breadth with the floor, but ſo unevenly
“ wrought, that I have ſeldom obſerved worſe maſonry in the ſame materials. It
“ receives light from three little windows (each about fourteen inches ſquare) in
“ the roof, and from a door, and thirteen windows, which open into the chapel,
“ formerly glazed whilſt the church was in good repair; but now ſtanding open,
“ without any other furniture than the iron-bars. Beſides theſe apertures, there is
“ a little door into a pair of ſtairs, which carry you to the top of the Virgin Mary's
“ chapel; but becauſe it is conſtantly kept ſhut, I ſhall mention it no further, but
“ refer you to the conſideration of the figures.

“ That which is ſo much admired in this place, is the conveyance of the voice;
“ every ſoft and gentle whiſper being as diſtinctly heard the whole length of the
“ paſſage, which is near twenty yards, as if you had applied your ear cloſe to the
“ mouth of the ſpeaker. It is uſual with ſuch as keep the cathedral, when they bring
“ ſtrangers hither, to place two perſons, one at each end, bidding them to apply
“ their mouths and ears alternately cloſe to the inner wall, and ſo diſcourſe toge-
“ ther; and in this manner the voice ſeems to me to be beſt conveyed: but upon
“ the exacteſt trials I could make, I found, that whether you laid your mouth to
“ the inner or the outer wall, or whether you ſpoke in the middle of the paſſage,
“ there was ſo little difference, that it required a very accurate obſervation to di-
“ ſtinguiſh any at all; and as little alteration could I find, by changing the place
“ of the ſtature; for neither by coming nearer together could I perceive the voice
“ magnified, nor by retiring to a greater diſtance (ſo I kept within the ſkirts of
“ the paſſage) could I find it at all diminiſh. And this is all I could obſerve con-
“ ſiderable, more than that an antient ſexton told me, that he remembered, that,
“ when the windows into the chapel had glaſs, the voice was heard more clear and
“ ſhrill than ſince they ſtood open.

“ At what time, and for what purpoſe this place was built, there are no records
“ now extant in the church, that can determine; but it is a tradition generally re-
“ ceived, that it was contrived by the monks to abuſe the devotion of the more
“ credulous ſort of people, who being trained hither to confeſſion, were overheard
“ by ſome of their confederates, they afterwards perſuading theſe ſimple penitents,
“ that they came to the knowledge of their ſins by divine revelation. Yet upon
“ ſerious view of the place, I am more inclined to believe, that this effect was merely
“ caſual, and it was originally intended only as a paſſage from one iſle to the other,
“ without deſcending into the body of the church, which is a great way about;

"and caſt into this compaſs-figure, that it might not prejudice the ſight of the eaſtern window of the choir, which is one of the faireſt and largeſt that I have ſeen.

"I ſhall now conclude with a ſhort account of the cauſes of this effect, which I conceive to proceed merely from the cloſeneſs of the paſſage, the voice being carried here, as in a hollow pipe or trunk: for ſound being, as I apprehend, nothing elſe but a motion or undulation of the air, propagated orbicularly from the concurrence or colliſion of two bodies, as from a center, in the ſame manner as we ſee little waves ſpread themſelves on the ſuperficies of the water when a ſtone is caſt into it; it muſt follow, that in the open air, where the voice hath room to dilate, the further progreſs it maketh, the more weak it muſt grow, every little wave or circle moving one greater than itſelf; which it cannot do without diminution of its ſtrength and vigour: whereas the voice being confined in ſmall channels, whether they are ſtrait or crooked, may be continued to an infinite diſtance; becauſe each circle moving another, no bigger than itſelf, may give it an impreſſion of equal force; as may be ſeen in the fourth figure here annexed, where A repreſents the original of the ſound, B C D E, *&c.* the circles proceeding from it, which in the open air increaſe ſo faſt, as that the motion either ſuddenly vaniſheth, or at leaſt becomes imperceptible to the organs of the ſenſe: which happens otherwiſe where the voice is contracted into a narrow ſpace, as may appear in fig. 5, 6, 7. where the circles B C D E not having liberty to ſpread as in the open air, preſerve the voice entire all the way it paſſeth through thoſe cloſe tunnels: And to this cauſe I attribute the conveyance of the voice in this paſſage, ſo great a ſpace; for the walls conſiſting of hard and ſolid ſtone, and not penetrable by ſound, do not ſuffer the undulation of the air to expatiate or grow wider, by which means the voice is carried through it in an equal tenor.

"And if any man ſhall object, that the voice cannot be carried here as in a pipe, in reſpect there are ſo many doors and windows in this paſſage, out of which, as out of ſo many gaps, the ſound would eſcape; I anſwer, that in thoſe, which are kept glaſed and ſhut, there can be little or no inconvenience: and for the other, it is a cauſe, no doubt, as was formerly obſerved, of impairing the ſound, though not enough totally to debilitate it, becauſe the greateſt part of the paſſage is cloſe. Beſides, the voice returned at the angles of the paſſage, before it meets with theſe apertures, proceeds in a direct line from R to S, and there, by the reſiſtance of the inner wall, is hindred from expatiating itſelf that way at all; and therefore can only ſpread itſelf ſideways towards the little chapel, by which means there is much leſs loſt than if the courſe of the ſound were directly againſt theſe open places. And I am the more confirmed in this opinion, becauſe the learned KIRCHER relates, that the governors of the Roman aqueducts have aſſured him, that in ſome of them, near as capacious as ours, a whiſper hath been heard five hundred foot, which is about eight times as far again as here; the meaſure of the Italians little differing from the Engliſh. And I can ſee no reaſon, if it may be heard in them ſo great a diſtance, but that it may be carried here for ſuch a ſpace, though with ſome diſadvantages.

" But theſe are only my preſent aprehenſions, which I ſhall ſubmit to the cenſure
" of better judgments, in which though I am miſtaken, I ſhall think my labour
" well beſtowed, if this weak undertaking may give an occaſion to ſome perſon of
" greater ability to diſcover the truth.

" Fig. 1. A, part of the choir.
" B C, the two iſles of the ſides of the choir.
" D F E, the eaſtern window of the choir.
" D G E T N S V, the paſſage or whiſpering place.
" H I, the little chapel or cell.
" M N O, the three little windows in the roof.
" P, the door into the ſtairs, which go to the top of the Virgin Mary's
" chapel.
" K L, the ſide between the paſſage and the chapel, in which are thirteen
" windows and a door into the chapel, all ſtanding open.
" R S, the places, where the roof riſeth from ſix foot three inches to be
" eight foot four inches high.

" Fig. 2. A, the profile of the paſſage from D to R, and from S to E.
" B, the profile of the paſſage between R and S."

Sir **Robert Moray**, Mr. **Evelyn**, and Mr. **Hoskins** were deſired to bring in writing to the next meeting the account of echos related by them.

Dr. **Croune** mentioned a way propoſed by Mr. **Stahl** of deſtroying gold irrecoverably; and was deſired to inform himſelf more particularly.

Dr. **Merret** ſhewed his *Materia Vitraria*; and was deſired to leave a part of each of the materials with the ſociety.

Mr. **Haak** propoſed a compendious way of repertory, and was deſired to communicate it to the ſociety.

Sir **Robert Moray** propoſed a perſon willing to be employed as a curator by the ſociety, and offering to furniſh them every day, on which they met, with three or four conſiderable experiments, and expecting no recompence till the ſociety ſhould get a ſtock enabling them to give it.

The propoſition was received unanimouſly, Mr. **Robert Hooke** being named to be the perſon.

November 12. Mr. **Colwall** undertook to ſend Mr. **Rooke**'s inquiries about tides and winds to St. **Helena**; and was deſired to add his own.

The lord viſcount Brouncker's ſolution of Dr. Goddard's third experiment was read, and found ſatisfactory, and ordered to be regiſtered [o]. It was as follows:

> "Becauſe the air incumbent upon A is equal in weight to the cylinder of quickſilver B C, therefore the quickſilver keeps at that altitude above A B. Now becauſe the whole cane and quickſilver A B C D is hanging at D, and becauſe the cylinder of B C is counterbalanced by the air upon A, therefore at D is the weight of the whole cane, quickſilver, and air. But air in air in this ſenſe weigheth not, for the air under hath a compreſſure equal to the weight of all above, and therefore impedes the deſcent thereof: therefore the weight at D or F is the juſt weight of the whole cane and quickſilver."

Sir Robert Moray was deſired to bring in writing his account of the echo in Scotland.

Dr. Charlton promiſed to provide a pike againſt the meeting for dinner, in order to ſhew every ſecond tooth moveable.

Sir Robert Moray propoſed Mr. Hooke as a curator of experiments to the ſociety; who being unanimouſly accepted of, it was ordered, that Mr. Boyle ſhould have the thanks of the ſociety for diſpenſing with him for their uſe; and that Mr. Hooke ſhould come and ſit amongſt them, and both bring in every day of the meeting three or four experiments of his own, and take care of ſuch others, as ſhould be mentioned to him by the ſociety.

The lord viſcount Brouncker moved, that the experiments concerning the meaſure of the firſt velocity of bodies might be proſecuted, *viz.* what force is required to raiſe, for inſtance, one pound weight one yard high in one ſecond of time. His lordſhip was deſired to be curator of that experiment.

Sir Robert Moray propoſed the trial, what proportion the velocity of a falling weight hath to that of a pendulum of a certain length: and he was deſired to be curator of it.

Sir William Petty's letter to the lord viſcount Brouncker concerning his double bottomed cylindrical veſſel, was read, and ordered to be regiſtered [p]; and he was deſired to proſecute this invention, and to give farther notice of the ſucceſs thereof upon the trial of the veſſel at ſea.

Mr. Graunt was deſired to give in an extract of Sir William Petty's letter to him poſterior to the former on the ſame ſubject.

Mr. Streete's propoſition about the longitude was read; and referred to the conſideration of the lord viſcount Brouncker and Sir Robert Moray.

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[o] Regiſter-book, vol. i. p. 196.

[p] It does not appear in the regiſter or letter-books.

Mr. Berchenshaw's paper on muſic was preſented by Dr. Charlton; and the lord viſcount Brouncker was deſired to examine it.

Dr. Wilkins and Dr. Goddard were reminded to proſecute the experiment of burning lamps under water, and to try it as well with ſpirit of wine as with oil.

Sir Edward Bysshe and George Smith, M. D. were propoſed as candidates by Dr. Wilkins, and John Dryden, eſq; by Dr. Charlton.

November 19. Dr. Goddard made the experiment of quickſilver and water together in a glaſs cane of $6\frac{1}{2}$ foot long; the cylinder of quickſilver being about $26\frac{1}{2}$ inches, and the reſt filled up with water. Inverted into the ſtagnant mercury, the cylinder of quickſilver ſubſided to $21\frac{1}{2}$ inches, and the water near $47\frac{3}{4}$ inches, and about three inches of air on the top of the water: which ſeems to overthrow the proportion of the weight between quickſilver and water, ſtated by ſome to be as one to near fourteen.

Dr. Goddard was deſired to proſecute this experiment in conjunction with Sir Robert Moray and Dr. Wilkins.

Mr. Hooke made the experiment of breaking ſeveral glaſs bubbles with rarefied air, and nipt up; of which ſome broke with a briſk noiſe, others not. He was deſired to bring an account in writing[q] of this experiment to the next meeting; as alſo to make the experiment of weighing the ſame glaſſes, firſt with the rarefied air, and afterwards with the common air admitted into them, when unſealed.

He undertook to ſhew an experiment about the tenacity of air; and acquainted the ſociety with an engine, which he had, for trying many experiments of condenſation; which engine was deſired to be made as ſoon as might be.

Dr. Croune acquainted the ſociety with a letter, which he had received from Dr. Power, who promiſed in it to ſend ſhortly an account of thoſe ſubterraneous experiments formerly recommended to him.

Sir Edward Bysshe, Dr. Smith, and Mr. Dryden were elected into the ſociety.

Mr. Colwall brought in ſome inquiries for the Eaſt-Indies[r], to be added to thoſe, that were formerly offered by others for theſe parts: and it was deſired, that as many of the ſociety as had any more queries proper to be ſent thither, would prepare them againſt the next meeting.

Dr. Charlton was deſired to bring in an account of his obſervations upon the teeth of pikes, and upon thoſe of the *Rana piſcatrix*: And

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[q] It is printed in his *Philoſophical experiments and obſervations*, publiſhed by W. Derham, F. R. S. p. 9—13. Edit. London 1726. 8vo.

[r] See Regiſter-book, vol. i. p. 212. and Dr. Sprat's Hiſtory of the Royal Society, p. 158.

Mr. GRAUNT to communicate an extract of Sir WILLIAM PETTY's letter concerning the new faſhioned ſhip, together with a model of it, at the next meeting.

The lord viſcount BROUNCKER gave his thoughts upon Mr. BERCHENSHAW's paper on muſic, objecting, that he made a half note bigger than a whole note, and every half note of a differing quantity, *&c.*

Dr. WILKINS being called upon for a farther account of his experiments of making lamps burn under water, promiſed to give it in at the next meeting, and to add what he had lately tried about a way-wiſer.

It was moved by Sir ROBERT MORAY, that a ſyphon with a cock might be added to the veſſel for the burning lamps under water, to let in the air towards the continuance of the burning.

Dr. CHARLTON gave an account of making the powder for embalming birds, and preſerving them and their feathers to the life. He was deſired to communicate in writing the whole proceſs, according to the relation made by him. This proceſs, as regiſtered [a], was as follows:

Pulvis condiendis avium cadaveribus utiliſſimus.

" Pulveris, quo ad avium cadavera condienda, earumque plumas tanto colorum
" nitore, ut influxu vitali continuò illuſtratas crederes, diutiſſimè conſervandas
" hodiè utitur generoſiſſimus juxta ac ingenioſiſſimus vir, dominus JOHANNES
" CREWE, formula talis eſt.

" ℞ *Myrrhæ, benzoini, ſtyracis calamitæ, caryophyllorum, & cinnamoni,* āā ℥j.
" *calami aromatici & ſulphuris vivi* āā ℥ß. *ſantali albi* ʒiij. *camphoræ* ℈j.

" Fiat omnium pulvis, qui ſpiritu vini optimo in paſtam reducendus, & exen-
" teratis cadaverum cavitatibus dextrè inferciendus."

Dr. SMITH was deſired to procure the obſervations made by his brother concerning cyder:

Sir PAUL NEILE to communicate his obſervations on the ſame liquor: And

Dr. CHARLTON and Dr. MERRET to bring in their obſervations upon the preſerving of ſeveral of the more delicate ſorts of wine, ſuch as Champagne, Florence, Frontignac, *&c.*

Mr. MATTHEW WREN acquainted the ſociety, that the lord chancellor, upon the intimation of their deſire, had expreſſed his readineſs to communicate to them ſeveral papers of Mr. HARRIOT, which he had in his cuſtody; and that he would give Mr. WREN acceſs to his trunks for them.

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[a] Original Regiſter, vol. ii. p. 41.

Mr. HAAK made a relation of what he had learned concerning oiſters at Colcheſter, and was deſired to give it in writing at the next meeting.

Col. TUKE promiſed to bring in likewiſe an account of the ſame ſubject.

A hint was given, that the poſition of oiſters, and a certain quality of the ground, together with the ſalt, are the cauſe of their greenneſs: And

That oiſters are good to be eaten after ſome days of dry weather following upon much wet.

Farther inquiries were ordered to be made, whether the ſpawn of oiſters ever ſwims.

Mr. HAAK ſhewed the ſociety a ſpecimen of his repertory.

Dr. CROUNE's account of the experiment of breaking wire was referred to the next meeting.

November 26. Mr. DRYDEN was admitted.

The lord viſcount BROUNCKER acquainted the ſociety with the approach of St. Andrew's day; and that by reaſon of the neceſſity of making ſome alterations in their charter, there could not be conveniently made an election of new council this year: but it was offered to the ſociety, whether they would propoſe ſome other perſons to be preſented to the king, and, according to his majeſty's pleaſure, to be put into the council of the altered patent, inſtead of ſome of thoſe, who were in the firſt.

Upon which it was put to the queſtion, whether in caſe any ſuch alteration of the members of the council ſhould be made, it ſhould be done by ballot, or open vote; and it was carried for the latter.

After which it was put to the queſtion, whether any alteration ſhould be made in the council, or not? and it was carried in the negative.

Mr. HOOKE brought in his account of the experiments tried with glaſs-balls: 1. Of driving out the air by heat only. 2. Of driving it out by vapours. 3. Of their breaking of themſelves. 4. Of their breaking by a knock. 5. Of the quantity of water they admitted. 6. Of the weight of the air admitted. 7. Of their ſhrinking and ſtretching. 8. Of their breaking outwards; which was read, and was as follows[t]:

" A ſmall tube of white glaſs melted in the flame of a lamp was blown into a
" pretty large ball (near the ſize of a tennis-ball) the ſmall neck or pipe of which
" being, whilſt the ball was yet red hot, ſuddenly and carefully ſealed up hermetically;

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[t] Original Regiſter, vol. ii. p. 37.

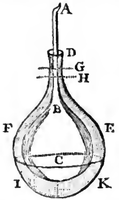
“ cally; I obſerved, that theſe balls or bubbles being left to cool, ſome of them, that were either not very equally or over thin blown, would in the cooling break inward with a briſk and loud noiſe; ſome ſooner, whilſt yet hot; others later, when even quite cold; but theſe later yielded much the louder report. Some, that were ſtrong and even blown, remained entire when quite cold; the which balls I obſerved to endure a much greater and more violent blow before they would break, than others much of the ſame make, which were left to cool without ſealing up. But when with a pretty briſk blow they were broken, they yielded, beſides the noiſe of the blow, ſometimes a ſmart, at other times a more faint noiſe: ſome of theſe bubbles, whilſt thus hermetically ſealed, being poiſed in a pair of exact ſcales, and the title ſealed and nipt off and put into the ſame ſcale, a ſibilus or hiſſing noiſe might very eaſily be heard to enſue, for the ſhort ſpace of about half a ſecond of time; after which the ſame ſcales and counterpoiſe being left free, the bubbles were always obſerved to preponderate, ſome by $\frac{1}{4}$ of a grain, others half, and others more. The ends of ſome other of theſe being broken off under the water, the water was obſerved to aſcend with a very great impetuoſity, and when within the ball, to look white, until ſuch time as it had filled the bubble or ball about $\frac{2}{3}$ or $\frac{3}{4}$ of the whole capacity; ſome more, ſome leſs, according as the balls were more or leſs hot when ſealed up. Holding the balls of ſome of theſe unſealed bubbles over the flame of a candle, till the water was boiled or exhaled away (ruſhing out very impetuouſly through the ſmall ſtem) I immediately ſealed up the ſmall end again, and obſerved ſome of them to break with a much louder crack than thoſe, that had been ſealed up when red hot. One, that had a very ſmall paſſage through the neck, being kept too hot in the flame, burſt outward with a very great violence and noiſe: breaking off the tips of others under water, I found a much greater quantity of water to enter, in ſo much as to fill almoſt the whole ball, leaving a very little bubble of air at the top. Others that I weighed I found to increaſe more in weight by the admiſſion of air, than they had done before the other ſealing.

“ After this, having emptied out the water, I put into ſome of them a ſmall quantity of indifferently well rectified ſpirit of wine, and holding the ball over the flame of a lamp, till the ſpirit with great impetuoſity was evaporated and driven out (which I preſently perceived, by the ceaſing of the vapours at the tip) I ſealed up the tip, and proceeding as with thoſe I tried with water, I found theſe to differ very little from thoſe, both as to the noiſe they yielded, and in their admitting of water: and as to the weight of the air, both theſe two laſt ways I found to differ from the firſt, in this, that whereas the red hot glaſſes, when cold, were clear, theſe, though they appeared clear when hot, were notwithſtanding all tarniſhed over with a kind of dew in the inſides when cold; which dew would quickly diſappear, if they were again heated pretty hot. There were ſeveral other circumſtances, which becauſe they will be more notable in other experiments, I here omit.”

A conjecture at the cauſes.

“ That the elaſtical power firſt of the exceedingly heated parts of the air, that are within the ball of the glaſs, when red hot, being very much intended, a very

“ ſmall parcel is able to preſs and keep out all the reſt of the ambient contending
“ atmoſphere; even as in the next place a ſmall parcel of water, or ſpirit of wine,
“ rarefied into vapours by a not very ſtrong heat, is likewiſe able to do. Now
“ whilſt the air is thus thruſt and kept out, the paſſage being firmly ſhut, the ambient
“ air is hindred from ruſhing in that way, though the heat within the ball
“ decreaſing, and ſo likewiſe the elater both of the air and vapour (the latter for
“ the moſt part returning or falling back into their priſtine forms of water or ſpirit
“ of wine, and ſo ſticking about the inſides of the bubbles) would not have
“ been able to have hindred its ruſhing in. Now the preſſure of the included
“ body againſt the inſides of the glaſs (whether air or vapours) decreaſing with its
“ elater, and that with the heat, and the preſſure of the ambient remaining the
“ ſame, that curious arched vault of the glaſs is forcibly preſſed and cruſhed together,
“ and ſo the particles are put into a cloſer texture. Now the difference of
“ the internal and external preſſure increaſing by the decreaſe of the included air's
“ elater, if ſome parts of this arch (if I may ſo call it) be weaker than the reſt, or
“ irregular, the ambient preſſure breaks it in; even as in architecture, the ſame
“ would happen in thoſe larger vaults, if in either of theſe particulars they deviate
“ from the rules of that art. But if they be ſufficiently ſtrong and equal, the ambient
“ preſſure makes the cryſtalline vault the firmer, as in arches of ſtone is commonly
“ obſerved. Now that the parts of glaſs are preſſed cloſer together, I
“ found by this experiment: I fitted a pretty large bubble with a ſlender neck



“ (ſuch as A B C in the figure) into a bolt-head D E F,
“ whoſe neck D was drawn very ſmall, and only left
“ big enough to contain the neck A B of the bubble,
“ and whoſe bottom I K was cut off, that thereby the
“ the ball might be included. Having thus fitted the
“ ball into the bolt-head, I ſhut on the bottom again
“ with cement, and filling up the ſpace left in the bolt-head
“ with water, till it reached into the ſmall of the
“ neck as high as H; I nipt off the ſealed top of the
“ bubble A, whereupon the water in the ſmall neck roſe
“ about $\frac{1}{8}$ of an inch from H to G, which could proceed
“ from nothing elſe than the relaxation or return of the
“ compreſt parts of the included ball, to its former dimenſions
“ and poſitions they were left in before the
“ ball was ſealed up; which, by the way, affords an inſtance
“ of compreſſion, wherein that ſo hard and exactly
“ uniform body of glaſs is compreſſed into leſs
“ room, and that by no greater preſſure than that of the incumbent atmoſphere;
“ which, when moſt with us in England, is no more than the preſſure of quickſilver
“ thirty inches thick or high; a very good argument, that other bodies
“ which are not ſo uniform and hard, are not without many interſtitia or pores:
“ and whether water and other fluid bodies may not ſuffer the like compreſſion,
“ trial will inform. The cauſe of the noiſe I dare not yet determine, but I think
“ it worth a further inquiry, whether it proceed not from the impetus, wherewith the
“ broken pieces of glaſs are daſhed againſt one another, though the noiſe ſeem of
“ another kind; or, 2dly, from the ſudden ruſhing of all the parts of the ambient

" air towards the middle of the ball, whereby all the other parts of the circumambient air being likewiſe moved towards the ſame middle, each hinder part ſucceedeth into the ſpace deſerted by the former, till the air within the drum of the ear endeavouring to ſucceed into the place of that without, may thereby move the film, and ſo cauſe the ſound to be heard; or, 3dly, which ſeems to be moſt plauſible, from the ſudden and violent ruſhing toward the center, and (by there meeting each other, or at leaſt the broken pieces of glaſs) as ſudden and violent recoil: one of which two laſt (if not a 4th, namely, the ſudden flying out of the air) ſeems to be the reaſon of the noiſe of a diſcharged ſhot of powder. The alteration, as to weight, does clearly enough proceed from the admitted parts of the air, whoſe admiſſion the hiſſing noiſe plainly ſpeaks: a manifeſt experiment, that air doth gravitate in air. The violent ruſhing in of the water argues the forcible preſſure of the external, as the multitude of bubbles do the languid reſiſtance of the included air.

" *The experiments ſuggeſt theſe queries:*

1. " By what means heat rarefies and expands bodies?
2. " The ſtrength of a knock, or the force of falling bodies?
3. " What may be the cauſe of noiſe or ſound?
4. " Whether the cauſes of the almoſt ſimilar phænomena of the glaſs drops may not be deduced from theſe principles? or what may be their cauſes?
5. " What is the weight of air in winter?"

This paper was ordered to be conſidered at the next meeting, and the author deſired to ſhew then the ſeveral experiments mentioned in it, and to have ready a ſcheme in great of the glaſs veſſels, by which he endeavoured to prove, that the parts of glaſs were preſſed cloſe together.

He was deſired likewiſe to think upon ſome experiments of freezing.

Mr. HENSHAW was alſo put in mind of the experiments of freezing, mentioned by him formerly to the ſociety.

Dr. CROUNE brought in Dr. POWER's ſubterranneous experiments, which were ordered to be read at the next meeting, and the amanuenſis to draw large ſchemes thereof.

Sir ROBERT MORAY's letter to Sir PHILIBERTO VERNATTI, in Java in the Eaſt-Indies, recommending to him the queries of the ſociety, was read; and it was ordered, that a copy of it be kept[a], and that the queries ſhould be made ready with all ſpeed, with an inſertion in them of thoſe preſented this day by Mr. COLWALL, Mr. HOSKYNS, and Mr. HAAK, and of that mentioned by Dr. ENT concerning the ſpring-tides falling out at the quarter moons in the Eaſt-Indies.

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[a] It is entered into the letter-book, vol. i. p. 67. and was dated at Whitehall November 24, 1662.

Dr. CHARLTON being called upon for his account of the pike's moveable teeth, and he deſiring to have the bringing of it in deferred it till the next meeting, Dr. ENT mentioned another fiſh having two rows of teeth, of which the innermoſt are all moveable.

Sir WILLIAM PETTY's ſecond letter to the lord viſcount BROUNCKER was read, giving a farther account of his new ſhip; as alſo an extract of another letter of his to Mr. GRAUNT, who was deſired to let Sir WILLIAM know, that the ſociety was well pleaſed with the invention:

And it was farther ordered, that thoſe members, who were in Ireland, or any three of them, ſhould be deſired by the preſident, in the name of the ſociety, to ſend them an account of this new ſhip, both as to her ſtructure and ſailing.

Dr. WILKINS brought ſome farther account of the lamps burning under water in the midſt of the glaſs-veſſel; and was deſired to proſecute the ſame, and to bring in the whole in writing.

He ſhewed his way-wiſer, and the effects thereof upon a coach; and was deſired to leave his firſt engine of this kind with the ſociety.

Dr. SMITH's paper concerning cider was read, and ordered to be regiſtered [y]: it was as follows:

" The beſt time to grind the apples is immediately from the tree, ſo ſoon as " they are thoroughly ripe; for ſo they will yield the greater quantity of liquor, the " cider will drink the better, and laſt longer, than if the apples were hoarded: " for cider made of hoarded apples will always retain an unpleaſant taſte of the " apple, eſpecially if they contract any rottenneſs.

" The cider, that is ground in a ſtone caſe, is generally accuſed to taſte unplea- " ſantly of the rinds, ſtems and kernels of the apples; which it will not, if ground " in a caſe of wood, which doth not bruiſe them ſo much.

" So ſoon as the cider is made, put it into the veſſel (leaving it about the ſpace " of one gallon empty) and preſently ſtop it up very cloſe: This way is obſerved " to keep it longer, and preſerve its ſpirits better, than the uſual way of filling the " veſſel quite full, and keeping it open till it hath done fermenting.

" Cider put into a new veſſel will often taſte of the wood, if it be pierced " early; but the ſame ſtopped up again, and reſerved till the latter end of the " year, will free itſelf of that taſte.

" If the cider by ſharp and thick, it will recover itſelf again; but if ſharp and " clear, it will not.

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[y] Regiſter-book, vol. i. p. 207.

" About March (or when the cider begins to ſparkle in the glaſs) before it be " too fine, is the beſt time to bottle it.

" Cider will be much longer in clearing in a mild and moiſt, than in a cold and " dry winter.

" To every hogſhead of cider deſigned for two years keeping, it is requiſite to " to add (about March the firſt year) a quart of wheat unground.

" The beſt fruit (with us in Glouceſterſhire) for the firſt year's cider are the " red-ſtreak, the white and red muſt apples, the ſweet and ſour pippin, and the " Harvey apple.

" Pear-mains alone make but a ſmall liquor, and hardly clearing of itſelf; but " mixed either with ſweet or ſour pippins, it becomes very briſk and clear.

" Muſt-apple cider (though the firſt made) is almoſt the laſt ripe, by reaſon " that moſt of the pulp of the apple paſſing the ſtrainer in preſſing makes it exceeding thick.

" The cider of the Bramſburrow crab, and Toxwhelp is not fit for drinking till " the ſecond year, but then very good.

" The cider of the Bramſburrow crab yields a far greater proportion of ſpirits " in diſtillation, than any of the others.

" Crabs and pears mixed, make a very pleaſant liquor, and much ſooner ripe " than pears alone."

Several other papers were brought in, *viz.* of Sir ROBERT MORAY concerning an echo in Scotland, and of Mr. HAAK concerning oiſters; as alſo Mr. WINDE's larger ſcheme of the whiſpering place in the cathedral of Glouceſter, according to Mr. POWLE's deſcription formerly ſent to the ſociety: all which were ordered to be read at the next meeting.

Dr. ENT promiſed to communicate ſome remarks upon oiſters.

Dr. CHARLTON delivered in his obſervations upon wines, which were ordered to be kept; or, if he took them home, he was deſired to bring them again at the next meeting.

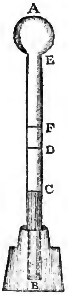
December 3. Mr. HENSHAW read his experiments of freezing, and was deſired to add more to them, and to bring them againſt the next meeting.

Dr. WILKINS ſuggeſted an experiment of putting water freed from air into Mr. BOYLE's engine, and to let it freeze there, in order to ſee whether it will not be a clear ice.

Dr. Whistler ſuggeſted, that the freezing of ſalt-water renders it freſh: and Mr. Hill confirmed this, by alledging, that the people of Amſterdam uſe frozen ſea-water for brewing.

Dr. Power's paper of ſubterraneous experiments, and obſervations made of the damps of coal-mines, were read, and afterwards regiſtered; and were as follow [a]:

Experiment 1.



" At the top of the coal-pit, we took the weather-glaſs A B, whoſe ſhank E B was about $2\frac{1}{2}$ foot long, of a ſmall bore, and the head A E $2\frac{1}{2}$ inches in diameter; and heating the head thereof, and emerging it preſently in the glaſs full of water B, the water, after a competent time, roſe up to the point C, where we let it ſtand for a while, till we ſaw, that the external and internal air were come to the ſame temper and elaſticity: then carrying the weather-glaſs (ſo prepared) in a ſcoop, down to to the bottom of the coal-pit (which was not above 35 yards deep) there the water in the weather-glaſs did riſe up to the point D, *viz.* very near three inches higher than its firm ſtandard C.

Experiment 2.

" The 6th day of November, 1662, we repeated the ſame experiment as before, in a pit of 68 yards deep, and there we found, that at the bottom of the ſaid pit, the water in the weather-glaſs did riſe very near four inches higher than the point C, *viz.* one inch higher than the point D, to F: now we obſerved, that, in carrying down of the ſaid glaſs in a ſcoop, from the top to the middle of the pit, then the water did not riſe ſo much as it did from the middle to the bottom, by half an inch: ſo that, it ſeems, the riſe of the water was not proportional to the glaſs's deſcent in the pit.

Experiment 3.

" We took a very good armed loadſtone, of an oval figure (whoſe poles lay in the long diameter) and, at the top of the coal-pit, we loaded the ſtrong pole, which is the north-pole, with the greateſt weight it was able to carry, even to a ſcruple: then taking the ſtone down to the bottom of the pit, and having on the ſame weight again to the ſame pole, we could perceive no difference in the power of the ſtone at the one place from the other; for it would neither lift more nor leſs than above: though to try this experiment preciſely, and to minute weights, is very tickliſh; for the ſame ſtone, in any place, will ſometimes lift a little more, and ſometimes a little leſs.

Experiment 4.

" We took a thread of 68 yards long (which is as long as the deepeſt pit is with us) and fixing a braſs lump of an exact pound weight to it, we counter-

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[a] Original Regiſter-book, vol. ii. p. 45.

“ poiſed both it and the thread with a weight in the other ſcale; then faſtening “ the other end of the thread to one of the ſcales, we let down the pendent weight “ near to the bottom, and there we found it to weigh lighter, by an ounce at leaſt, “ than it did at the top of the ſame pit.

“ We had tried this with a bladder full of water, and other ſubſtances alſo; “ but that our thread, by often turning, broke itſelf.

Experiment 5.

“ The colliers tell us, that if a piſtol be ſhot off in a head remote from the “ eye of the pit, it will give but a little report, or rather a ſudden thump, like “ a gun ſhot off at a great diſtance; but, if it be diſcharged at the eye of the pit “ in the bottom, it will make a greater noiſe than if ſhot off above ground. But “ theſe experiments are of a dangerous trial in any pits, and the colliers dare not “ attempt them, by reaſon of the the crazineſs of the roof of their works, which “ often falls in of its own accord, without any concuſſion at all.

Of the ordering of Coal-pits.

“ Every coal-pit hath its vent-pit, digged down at a competent diſtance from “ it, as 50 or 80 paces one from another. They dig a vault under ground, from “ one pit to another, which they call the vent head, that the air may have a free “ paſſage from one pit to the other. Now the air always has a motion, and runs “ in a ſtream from one pit to the other; for if the air ſhould have no motion “ (or vent as they call it) but reſtagnate, then they could not work in the pits. “ It is not requiſite, that the vent-pit ſhould be as deep as the coal-pit. Now “ the vent, or current of ſubterraneous air, is ſometimes one way, and ſometimes “ another; ſometimes from the vent pit to the coal-pit, and ſometimes contrariwiſe, as the winds above ground do alter; and alſo weaker and ſtronger at ſome “ times than at other; and ſometimes the vent plays ſo weakly, that they cannot “ work for want of ventilation. Then, to gather vent (as they call it) they “ ſtraiten the vault, and wall part of it up; ſo that the air, which before ran in “ a large ſtream, being now crowded into a leſſer channel, and forced to paſs “ through a narrower room, gathers in ſtrength, and runs more ſwiftly. Now “ it is obſerved, that the ſubterraneous air is always warm, and in the coldeſt “ weather, the warmeſt; ſo that it never freezes in the pit out of which the vent “ plays.

Of Damps, by the ſame.

“ There are three ſorts of damps; or rather, three degrees of the ſame damp; “ *viz.*

“ The $\left\{\begin{array}{l}\text{Common,}\\ \text{Suffocating,}\\ \text{Fiery.}\end{array}\right.$

“ The common damp is that ſubterraneous ſtream, or exhalation, which coming out of the earth, reſtagnates in the heads and under-ground cavities, and

“ hinders their candles from burning, ſo that they cannot work. 1ſt, If they incline their candle downward toward their ſeat, it is obſerved it will abide in the longer, and not ſweat away, and ſtifle itſelf with too much tallow, as it would do above-ground. 2dly, Though the damp be ſo great, that it extinguiſheth the candles, yet they can abide in it without ſuffocation. 3dly, This damp is ſometimes generated by the effluviums and perſpirations, that come out of their own bodies, that work, if they ſweat much; and if the candle be within the ſphere of thoſe effluviums, it will extinguiſh it as the former; as the colliers obſerve, that paſs from one head to another man, that is working in another head. This damp is ſometimes on the one ſide of the heads, and not on the other; and for the moſt part it runs all along the roof; ſo that a candle will burn, if ſet upon the ſeat; but if you lift it up into the ſuperincumbent region of damp vapours, it will be immediately extinguiſhed. Now beſides the playing of the vent, they ſometimes are neceſſitated to keep conſtant fires underground, to purify and ventilate the air: ſometimes the running of the ſcoops, when they begin to work, will ſet it in motion; ſometimes, if the damp draw towards the eye of the pit, they ſet it into motion, by throwing down of coal-ſacks: elſe the heavy vapour will reſtagnate there, and is not able to riſe.

Of the Suffocating Damp.

“ The ſuffocating or choaking damp is a more pernicious exhalation, or elſe a higher degree of the former, into which no man is able to enter, but preſently he is ſtifled, and dies. And it is obſerved, that the bodies of thoſe, which are ſo ſlain, do ſwell, and are puffed up exceedingly, as if poiſoned. This damp is ſeldom here in our pits; but, if it be, the firſt perſon, that is let down into it, is preſently killed: ſo that afterwards they try, by letting down of dogs, when it is removed, and fit to enter into; and moſt part, by letting down of lighted candles, which will be extinguiſhed by the damp at the bottom of the pit, if any damp be reſtagnate there.

Of the Fiery Damp.

“ The fiery damp is of all others the moſt dangerous, but is never ſeen in our pits. At Leeds, which is not above twelve miles off, as alſo in Lancaſhire-pits, and Newcaſtle-pits, I have heard much of it. It is a vapour, or exhalation, which comes out of the mineral, or out of the clefts in the mineral; and it ſometimes comes out fired, and ſometimes in the form of a ſmoke; which afterwards fires of its own accord, and then forces its way with that vehemency and activity, that it drives all before it, and kills without mercy, inſomuch that I have heard, not many years ago, three men in Newcaſtle-pits were ſo ſhattered with it, that their very limbs were ſevered with it.

“ This fiery meteor is obſerved to run all along the roof of the pit; ſo that if the colliers have the fortune to ſee it iſſuing out, there is no way to ſecure themſelves, but to lie flat unto the ſeat of the pit, and ſo do ſometimes eſcape ſo great a danger. Sometimes it hath taken its way, up at the pit-eye or ſhaft, with ſuch vehemency, that it has thrown the turn quite away from the mouth

" of the pit; which is a great cylinder of wood, of a great weight; and has burnt and ſinged the ropes as black as lightening does trees.

" In Sir William Gerrard's pits in Lancaſhire, and ſome others thereunto adjoining, there is the like damp very frequent, which the workmen alſo call a fiery one. The way to free the pits is this: One, thereunto hired, puts on a wet coarſe frock; this covers him all, face and head; two holes left for his eyes, and thoſe glaſed. Thus armed, he goes into the pit to encounter his enemy, with a lighted candle in his hand, and there lays himſelf flat on the ground, expecting his foe, the damp, which flies about the pit in the form of a little round cloud, of the bigneſs ordinarily (as he expreſſed it) of a bladder: to this he applies his lighted candle, which preſently takes fire, and not without a great noiſe and commotion of the air in the pit, and that a violent one, diſcharges itſelf. In ſome pits, if they omit to do this in due time, by the continual acceſs of new exhalations it grows ſo great, that the firing of it becomes very dangerous; an example whereof he told us: Three workmen going into a pit, wherein it was grown greater than ordinary, were, by its taking fire on a ſudden, banded from one ſide of the pit to the other with that violence, and ſo ſinged, that two of them are in danger of their lives.

" A, the coal-pit.
" B, the vent-pit.
" C, the ſow, that drains both pits and heads from water.
" D, the vent-head, which runs from the coal-pit to the vent-pit, underground, and is not above two yards broad with us.
" E, the lateral heads, which are not above two yards broad alſo.
" F, the diagonal pricked lines is the thurl-vent, that is, a vent through the lateral heads.
" G, the walls or pillars of the whole coal-bed remaining, which coal-bed with us is not above two foot thick, theſe walls or pillars of coal are always left ungotten, and to ſupport the roof the pit-heads, to hinder it from falling.
" The roof and ſeat is the top and bottom of the works, wherein they get coals, which is about two foot, or more, the one diſtant from the other, in our pits."

After reading of this paper it was obſerved, that there were ſome other experiments formerly recommended to Dr. Power; and that it was deſirable to have them likewiſe tried by him at his conveniency, *viz.*

1. Of letting down a bladder gently diſtended, to ſee, whether it would grow more or leſs flaccid above ground or below.

2. Of the ſubſiding of quickſilver in the Torricellian experiment under ground, and obſerving the differences at ſeveral depths.

3. Of trying, in the deepeſt part, how many vibrations of a pendulum of about 2½ inches long, a noiſe heard at the bottom is heard at the top.

Sir Robert Moray's account of an echo in Scotland, was read, and his offer of having it more fully inquired into, and more exactly deſcribed, was accepted. The account is as follows[y]:

" Near Roſneath, a fair houſe, ſituate upon the weſt ſide of a ſalt-water lake, which enters into Clyde ſome 17 miles below Glaſgow, there is a large bay, environed with high grounds, in ſome places rocks, and in others covered with thickets of trees, a proſpect and deſcription whereof is hereunto annexed, taken only from inſpection of the place, and the relation of ſuch as have lived there.

" Having heard of a rare echo in the bay, I engaged ſome acquaintance, one evening, when the air was ſerene and calm, to ſatisfy my curioſity in making a trial of it. And having lighted on a very good trumpeter, who knew the place well, we came to the point of the bay at A, where the trumpeter placed himſelf near the brink of the water, which was then ebbed ſo low, it left the beach ſome 14 or 15 foot high, like a ſteep bank about him: then ſetting his face toward C, he ſounded a tune of eight ſemibriefs, and then ſtópped. Juſt as the trumpet ended the tune, an echo began to repeat it, which it performed completely and clearly, but not altogether ſo loud as the trumpet. And when that echo had repeated the whole tune, another echo began, and repeated it over again, as clearly and diſtinctly as the firſt, but with a ſoftneſs, that ſeemed to be as much weaker than the firſt echo, as the trumpet was louder. In like manner, no ſooner had the ſecond echo repeated the tune completely, but a third echo did begin, and repeated it once more, as entirely, clearly, and diſtinctly, as the others, with a degree of ſoftneſs and weakneſs, that ſeemed to hold proportion with the reſt; and then all was ſilent. This we tried again and again, with the ſame ſucceſs, to the great ſatisfaction of the company. I cannot venture to give any account of the preciſe places, whence the three ſeveral reflexions of the ſound came, becauſe I neither can condeſcend upon the preciſe time of the duration of the tune, nor the exact ſituation, figures, and diſtances of the hills, rocks, houſes, and woody places; only I do gueſs, that the tune laſted at leaſt ten ſeconds. That the firſt echo ſeemed to come from between B and C, the ſecond from about D, and the third from between D and E. But if the ſociety think it worth the labour, to procure an account of all, I will endeavour to employ a very ſkilful and curious perſon about it, who ſhall meaſure the duration of the tune, and of every reflexion and interval, by a half-ſecond pendulum; and taking the diſtances of places, by inſtrumental obſervations, ſhall make an exact map thereof; and withall give an account of ſome other echoes thereabout, which I forbear to mention, becauſe I never tried them.

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[y] Original Regiſter, vol. ii. p. 52.

"A, is a point of low ground, not 6 foot above the water at a full ſea, where "the beach is, at low water, pretty ſteep, like a bank, ſome 15 or 16 foot "in height.

"B, a rocky precipice, ſome ten or twelve yards high, eſteemed to be ¼ of "a mile diſtant from A, and extended in length ſome 100 or 120 yards, "woody at the top. Between B and C, lies a narrow valley, through "which paſſeth a ſmall brook, that drives a mill.

"C, a houſe, all built of ſtone, about which the face of the riſing hills is "rocky, and covered here and there with trees.

"D, is a church, ſtanding low upon the ſhore, near which the face of the "hill is rocky.

"E, another church, ſtanding low, on the north ſide whereof, at * * miles "diſtance, or ſo, the ground riſeth into hills, where there are rocky pre"cipices and woody places.

"F, the head of the lake, which is every where environed with high and "hilly ground, from within a mile of the river of Clyde.

"G,

"H, the houſe of Roſneath."

It was ordered, that Mr. BARROW be deſired to give an account of an echo at Cambridge.

Mr. HAAK's paper concerning Colcheſter oiſters was read; and ordered to be regiſtered [z].

After reading this paper, Dr. MERRET ſuggeſted, that it ſhould be inquired, whether oiſters do not differ in ſex, it being obſerved, that ſome of them, ſuppoſed to be females, are all white, and caſt forth a kind of ſpittle; and that others, eſteemed to be males, have a black ſpot, and do not ſpit. He mentioned likewiſe, that the age of oiſters was known by the thickneſs and friableneſs of their ſhells. He was deſired to communicate his obſervations upon this ſubject. He was alſo put in mind of his obſervations upon wires; and likewiſe of the way of making and colouring all ſorts of earthen veſſels.

Dr. MERRET alſo produced his catalogue of the natural things of England, and of the rarities thereof; which he was deſired to complete, and to communicate to the ſociety.

Mr. HOOKE made the experiment of weighing rarefied and common air in little glaſs-bubbles; and the difference was found to be near ½ a grain in one of them, and above ½ a grain in another [a].

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[z] Regiſter-book, vol. i. p. 209.

[a] This paper is printed in the *Philoſophical Experiments and Obſervations of Dr.* ROBERT HOOKE, publiſhed by W. DERHAM, F. R. S. p. 6.

He alſo brought in an account of meaſuring the expanſion of the air, *viz.* what proportion the decreaſe of its force holds to its increaſe of dimenſion; the reading of which was deferred till the next meeting.

He propoſed, for that meeting, the experiment of weighing aſcending and deſcending bodies in water, *viz.* what weight they add to the veſſel containing the water.

He was deſired to prepare alſo for the making of the experiment of water freed from air; which, according to Monſ. Huygens[b], does not deſcend in the cane, after the air is exhauſted out of the receiver.

Dr. Goddard was deſired to make Linus's experiment, mentioned by Monſ. Huygens in the ſame letter, *viz.* of the finger's ſticking cloſe to the tube, with both ends open, and ſhorter than 9½ inches.

December 10. The experiment of purging water from air, to ſee whether it ſubſides, according to the Torricellian experiment, was deferred till the next meeting, becauſe the engine was not tight.

Dr. Croune brought in ſome account of the breaking of wires; the experiment whereof appearing as yet very uncertain, he was deſired to proſecute the ſame, by trying ſeveral wires of different matter, and the ſame ſize, to ſee, whether the proportion of toughneſs in different metals may be found.

Mr. Henshaw preſented his experiments of freezing; which were ordered to be regiſtered[c], and were as follow:

1. " Take a beer-glaſs, and fill it with water up to the brim; then ſtrike it " over with a knife, that the water may not ſtand higher in the middle than at " the ſides; ſet it out to freeze, and you ſhall find the ice ſtand a conſiderable " height above the brim of the glaſs, proportionably to the quantity of water, " that was contained in it.

2. " Take a bolt-head, and fill it with water till it riſe 4 inches in the neck; " make a mark where the water ſtands, and leaving it open at the top, expoſe it " to the cold, and when it is frozen, you ſhall find the ice riſe much higher in " the tube than the water was.

3. " Take a ſmall bolt-head of white glaſs, whoſe globe is not above 3 inches " diameter; cut off the tube within an inch of the globe, fill it with water up to " the neck, ſtop it well with a cork, ſo as there be left no ſpace between the cork " and the water; cut the cork cloſe to the tube, and cover it over well with molten hard wax; expoſe it, and when it is frozen, you will find it equally ex-

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[b] In a letter to Sir Robert Moray, from the Hague, 1 Dec. 1662, N. S. entered in the Letter-book, vol. i, p. 69.

[c] Original Regiſter, vol. ii. p. 42.

“ tended every way, that the globe will be cracked into many circles, almoſt exactly equidiſtant, and interſecting one another, like meridians at the poles.

4. “ It were worth the trial, whether any of the former experiments would ſucceed in the ſame manner with water, whoſe air hath been exhauſted in Mr. Boyle's engine.

5. “ Take a good quantity of roſemary, box, holly, ivy, cypreſs, or any other plant, that is green at this time of the year; when you have well dried them in an hot oven, ſet fire to them, and burn them to aſhes, each apart from the other, and with ſeveral aſhes make ſeveral lixivia's; or for the want of them, with the ſalt of wormwood, ſcurvigraſs, and other ſalt of plants, to be found ready made at the apothecaries; expoſe theſe ſalts in earthen pans or diſhes, and at the ſame time common water in the like veſſels; by which may be experimented the truth of what is related by QUERCETAN and other chemiſts, that the figures and ſhapes of the plants will be found in the ice: and whether the ſame may not caſually happen in common water; for I have ſometimes obſerved in the ſuperficies of pond-water frozen in that manner the figures, as it ſeemed to me, of oaken leaves, and ſometimes of other plants.

6. “ Make ſeveral lixivia's of common ſalt, allum, petre, the ſeveral vitriols, ſal-gem, borax, ſal armoniac, ſandiver, *&c.* expoſe them as you did the lixivia's of the herbs, in divers diſhes of the ſame magnitude and capacity, and obſerve whether they do all freeze as ſoon and as hard the one as the other; for to me it happened, that the lixivium made with ſaltpetre did not freeze at all.

7. “ Take common water, whoſe air hath been drawn out in Mr. BOYLE's engine, and freeze it in a ſmall bolt-head (for ordinary water ſo frozen, by reaſon it is turbid and full of cavities, will not do) then gently breaking off the glaſs, try whether in a clear day it will not contract the ſun-beams to a point, and burn in ſome meaſure like a cryſtal ball. For want of ſun, the contraction may be tried with a candle.

8. “ Take common water freed from air, as above-ſaid, and freeze it in open glaſſes, made of any ſection of a ſphere, or cut off from a hollow globe of glaſs by a hot iron, or on a ſpectacle-maker's tool; try whether it will magnify equal to a glaſs of the ſame radius, or what refraction it will make of the viſible ſpecies: as alſo what diaphaneity it hath proportionally to a glaſs of the ſame thickneſs.

9. “ Try whether warm water will ſooner freeze than cold water expoſed at the ſame time, and in the ſame quantity, as it is affirmed by ſome authors.

10. “ Try whether the firſt ice, that cruſteth on ſea-water or ſalt diſſolved in common water, be freſh, as it is ſaid.

11.

11. "Take a bolt-head, put in a good quantity of ice, in as big lumps as you can get to go into the mouth of it: ſeal up the bolt-head hermetically, then weigh it immediately, after thaw the ice, then weigh it again, and ſee whether it weigh leſs than before, as is affirmed by Helmont in *Bartholinus de Nive*.

12. "Take what quantity of water you pleaſe, in a bolt-head open, weigh it it exactly, then expoſe it; when it is frozen, weigh it again, and ſee, if it does not weigh heavier.

13. "Take a quantity of ſnow, thaw it gently by the fire into water, then expoſe the water, and when it is frozen again, obſerve whether it be not more turbid and leſs diaphanous than common ice.

14. "Take an iron-pot, fill it with ſnow, place in the middle of it a bolt-head half full of water; ſet the pot over a flaming fire, that the flame may reach the ſides as well as the bottom of the pot; when the ſnow is almoſt all melted, take out the bolt-head, and ſee whether the water in it be frozen."

Dr. Merret gave an account of ſome of theſe experiments from his own obſervations, and was deſired to try the reſt, and to bring in the relation now made by him on the Wedneſday following in writing, together with what he ſhould obſerve in the mean time.

Mr. Oldenburg communicated ſome inquiries concerning freezing, which were recommended likewiſe to Dr. Merret to make the experiments of.

Dr. Croune brought in a dead parroquet to be embalmed by Mr. Crew at the recommendation of Dr. Charlton; who being abſent, the preſident undertook to convey it to him.

Several letters of Sir William Petty were read, concerning the farther ſucceſs of his new ſhip; one to the preſident, another to Sir Robert Moray, and two to Mr. Graunt; of all which extracts were ordered to be taken and entered[d]: and Dr. Wilkins was deſired to draw up a letter to Sir William Petty from the ſociety, expreſſing their thanks for his communications, and encouraging him to proſecute his invention.

Mr. Boyle ſent a pewter-bottle ſtopped up, broken with common water frozen in it.

Mr. Hooke's account of the rarefaction of air was read, and ordered to be regiſtered[e], as follows:

"I took a ſmall and indifferently even-drawn tube of glaſs, about ſix foot long, and leſs than $\frac{1}{4}$ of an inch in the hollow, that was open at both ends; and having

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[d] The extracts do not appear in the letter-book.

[e] Original Regiſter-book, vol. ii. p. 55.

" by a ſmall liſt of paper, that was paſted upon it, divided it into inches, halfs and " quarters, I put it into a bigger glaſs-tube, that was hermetically ſealed at one end, " and big enough to contain the former. Then I faſtned them perpendicularly " againſt the ſide of the wall, and filled them together to the top with quickſilver; " then letting the ſmall one riſe, till it aſcended ſomewhat more than four inches " above the ſurface of the mercury in the greater, I carefully ſealed up the upper " end of it with hard ſealing-wax, and letting it cool for about half an hour, I " lifted up the ſmaller tube, till the air was expanded ſo as to fill ſix inches, and " obſerved the ſubjacent pillar of mercury $10\frac{1}{8}$ inches. Then I lifted it higher, " till the air filled full eight inches, and found the ☿ $15\frac{1}{4}$ inches. And ſo proceeding, I collected this table; which by reaſon the tube (as " I afterwards found) was ſomewhat bigger toward the middle " than near the upper end, does not exactly agree with the hypotheſis, which ſuppoſes the degrees of rarefaction and force to be in " reciprocal proportion; though in other experiments of the ſame " kind, that I have formerly tried with a much more exact tube, " I have found it to come very near. Afterwards I depreſt again " the ſmall tube into the greater, and found the air to return to its " former dimenſions, which aſſured me, it had not leaked at " the top.

The air's expanſion.	The ☿ height.
4	00
6	$10\frac{1}{8}$
8	$15\frac{1}{4}$
12	$20\frac{1}{4}$
16	$23\frac{1}{8}$
20	$24\frac{5}{8}$
24	$25\frac{5}{8}$
32	$26\frac{1}{2}$

" This experiment, were there not, firſt, a great difference as to heat and cold in " the upper and lower regions of the air, which perhaps may render ſome of the " upper parts more denſe than the lower; and were there not, ſecondly, a great " diſparity in the conſtitution of the air by vapours and exhalations, which as they " may by mixing with the parts of the air much augment the gravity, ſo they " much alter the elater or expanſive power of the air; this experiment, I ſay, " were it not for theſe difficulties, would afford us a very deſirable help to gueſs at " the height of the atmoſphere. For ſince, by the accurate experiments of Mr. " Boyle, we have the height of the atmoſpherical cylinder, if of an uniform extenſion 35,000 foot, if we ſuppoſe the cylinder divided into 1000 equal parts, " each of theſe would be 35 foot long, did not the elaſtical power of the air, by " reaſon of the unequal preſſure incumbent on each of them, much alter this extenſion. And did the elater and preſſure of the greater cylinder of the atmoſphere follow the laws we have obſerved in this experiment, each of thoſe thouſand equal parcels of air would receive an increment (above its length of 35 foot) " which may readily be found and expreſſed by a number in the form of a fraction, " whoſe numerator is its diſtance from the ſurface of the " earth, and its denominator the complement of that " number to 1000. Thus the loweſt diviſion will be " $1\frac{0}{1000}$, the firſt above the ſurface of the earth $1\frac{1}{999}$, the " ſecond $1\frac{2}{998}$, the third $1\frac{3}{997}$, the fourth $1\frac{4}{996}$, the fifth " $1\frac{5}{995}$, the ſixth $1\frac{6}{994}$, and ſo till you come to the laſt; " as for inſtance, the 996 diviſion about the earth will " be extended to $1\frac{996}{4}$ of the loweſt, the 997 to $1\frac{997}{3}$, " the uppermoſt but two will be extended $1\frac{998}{2}$, the

1000	00000
999	35000
998	17500
997	$11666\frac{2}{3}$
996	8750
995	7000
994	$5833\frac{1}{3}$
993	5000

992	4375
991	$3888\frac{8}{9}$
990	3500
989	$3181\frac{9}{11}$
988	$2916\frac{2}{3}$
987	$2692\frac{4}{13}$
986	2500
985	$2333\frac{1}{3}$
984	$2187\frac{1}{2}$
983	$2058\frac{14}{17}$
982	$1944\frac{4}{9}$
981	$1842\frac{2}{19}$
980	1750
	125915
	Fractions 5 prox.

5000 a mile) 125920 Eng. feet ($25\frac{23}{125}$ miles.

" highest but one $1^{9\frac{6}{1}9}$, and the highest of all $1^{0\frac{0}{2}\frac{0}{0}0}$ ſeems " to be indefinite, and may perhaps aſcend many hundred " miles. And, according to this rule, having caſt up " the length of ſome of the uppermoſt, I found the length " or extenſion of the twenty equal diviſions next below the " uppermoſt, to amount to ſomewhat more than twenty-" five miles, as by the table appears. I think it were " worth while, by ſuch as have opportunity, to inquire " how near experiments made for the finding the air's " extenſion on high buildings or hills, and in deep wells " or mines, agree with this hypotheſis, and how much it " differs. This I am ſure, that there may be a very ſen-" ſible difference found in the preſſure of the air at ſo " little a height as thirty-five foot: for I lately made a " trial at that height with a convenient veſſel, and found " an inch difference in a cylinder of water. And this I " found conſtant, by repeating the experiment ſix or " ſeven times; but in what proportion it expanded, I " have not examined.

" After this experiment I opened the top of the ſmall tube, and filled up the " four inches of ſpace above the ☿ with coarſe ſpirit of wine, and then again I " carefully ſealed up the top with wax and cement, leaving not the leaſt ſenſible " parcel of air at the top. After this I found, that till I had, by lifting up the " ſmall pipe, made the cylinder of mercury about twenty inches high, there ſcarce " appeared any bubble: but then I obſerved three or four ſmall bubbles to ariſe " from the bottom, which there appeared no bigger than the point of a pin, but " aſcending grew bigger and bigger, with ſo ſtrange an increaſe, that they were " as big as peaſe before they came to the top; which bubbles now kept the ſpirit " of wine from touching the top. Proceeding, I obſerved this aerial ſubſtance to " extend itſelf, and fill half an inch, when the ſubjacent mercurial cylinder was " $26\frac{1}{2}$ inches; the ſpirit of wine falling four inches. I lifted the tube higher, and " found the aerial ſubſtance fill $4\frac{1}{2}$ inches, the ſpirit of wine $3\frac{1}{2}$, the ☿ $28\frac{1}{2}$. I " proceeded further, and found the aerial ſubſtance 27 inches, the ſpirit 3, and " the ☿ $29\frac{1}{2}$; which clearly evidences, that the aerial ſubſtance at the top (though " it ſeemed generated out of the ſpirit) had an elaſtical property, ſince the mercu-" rial cylinder increaſed in height, as that was more expanded; but whether it " were air, I dare not determine. Faſtning the ſmall tube at that height I had laſt " lifted to, I obſerved ſome riſing bubbles to increaſe more ſtrangely than before; " in ſo much as, when they came to the top, to throw up the ſpirit of wine before " them three or four inches: many of theſe I obſerved to do the ſame thing. I " heated that part of the tube, where the aerial ſubſtance was, but found it not de-" preſs the ☿; but heating that againſt the ſpirit of wine till it began to boil, the " ☿ was depreſſed above an inch; but removing the candle after a little time, " the ☿ returned to its former height. This experiment ſeems to me a good ar-" gument, to confirm the hypotheſis of the preſſure of the air upon the terraque-

“ ous globe. For the bubbles, that aſcend from the bottom of water, when the
“ top of it is expoſed to the free air, do very little, or not ſenſibly, increaſe in
“ bulk. And that becauſe their preſſure decreaſes but as 100006, 100005,
“ 100004, 100003, 100002, 100001, 100000, becauſe 100000 (which round
“ number we take for the preſſure of the atmoſphere) is added to 6, 5, 4, 3, 2, 1,
“ the preſſure of the water. Whereas when the 100000, or weight of the at-
“ moſphere is removed, the preſſure on the aſcending bubbles decreaſes as
“ 6, 5, 4, 3, 2, 1, 0.”

Mr. Hooke was deſired to make at the next meeting the experiment with quickſilver and ſpirit of wine, mentioned by him in the preceding paper:

To make that of weighing aſcending and deſcending bodies in water: And

To diſtil ſome water, and to ſee, whether the half of it being diſtilled weighs as much as the other half remaining in the retort; to find out, whether there be ſome parts in water ſubtiler and finer than others.

Sir Robert Moray deſcribed a kind of furnace, which puts air into a flame by pipes being outwardly heated and blown by bellows; by the means of which furnace, ſome perſons pretend to melt ore into water.

Mr. Hoskyns was deſired to peruſe the authors, who have written of Iceland and the neighbouring countries; and to collect thence the obſervables in thoſe parts for farther inquiry to be made thereof by a perſon going thither: and a weather-glaſs was directed to be ſent thither.

It was ordered, that Dr. Power be deſired to make ſome experiments of freezing in mines, together with the others not yet made by him.

Mr. Oldenburg read ſome aphoriſms for cider ſent to him in a letter from Mr. John Beale to be communicated to the ſociety; who ordered them to be regiſtered[f]. They were as follow:

1. “ He, that would treat exactly of cider and perry, muſt lay his foundation
“ ſo deep as to begin with the ſoil. For as no culture or graffes will exalt the
“ French wines to compare with the wines of Greece, Canaries, and Monteſiaſco;
“ ſo neither will the cider of Bromyard and Ledbury equal that of Allenſmore,
“ Hom-Lacy, and King's-Chapel, in the ſame ſmall county of Hereford.

2. “ Yet the choice of the graffe or fruit hath ſo much prevalency, that the
“ red-ſtreak cider will every where excel the common cider; as the grape of
“ Frontignac, Canary or Baccharach excels the common French grape, at leaſt till
“ by time and traduction in degenerateth.

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[f] Original Regiſter-book, vol. ii. p. 195.

3.

3. “ I cannot divine, what ſoil or what fruit would yield the beſt cider; or how
“ excellent cider or perry might be, if all ſoils in common, and all fruits were
“ tried: but for thirty years I have tried all ſorts of cider in Herefordſhire, and
“ for three years I have tried the cider in Somerſetſhire, and for ſome years I have
“ had the beſt cider of Kent and Eſſex at my call; yet hitherto I have always
“ found the cider of Herefordſhire the beſt, and ſo adjudged by all good palates.

4. “ I cannot undertake to particularize all kind of ſoil, no more than to compute
“ how many ſyllables may be drawn from the alphabet, the number of alphabetical
“ elements being better known than the ingredients and particles of ſoil;
“ as chalk, clay, gravel, ſand, marl, (the tenaciouſneſs, colour, and innumerable
“ other qualities, ſhewing endleſs diverſities) and the fruit of crabs, apples and
“ pears, being as various as of grapes, figs, and plums.

5. “ Yet in groſs this I note, that as *Bacchus amat colles*, and a light mold; ſo
“ our beſt cider comes from the hot rye-land; and in fat wheat lands it is more
“ ſluggiſh; and in white ſtiff clay-land (as in Woolhope in Herefordſhire) the
“ common cider retains a thick whey colour, and not good: only ſuch as emergeth
“ there (by the diligence of ſome art of the inhabitants) is bright and clear,
“ and ſo lively, that they are apt to challenge the beſt.

6. “ Some cider mixeth kindly with water in the cider-mill, and will hold out
“ a good ſmall wine, and leſs inflaming, all the following ſummer. Some cider
“ (as of Longhope, a kind of ſour woodland country of Herefordſhire) will not
“ bear any mixture of water, but ſoon decay, and turn more harſh and ſour: and
“ thus we noted in France, ſome coarſe wines ſtuck like paint in the glaſs, un-
“ willing to incorporate with the water. Vin d'Aye and other delicate wines did
“ ſpread themſelves more freely, as gold is more ductile than baſer metals.

7. “ Some would, for a fit, extol the cider of pear-mains, ſome of pippins (and
“ of pippins I have found a congenial liquor, leſs afflicting ſplenetic perſons, as in
“ mine own experience I conceived) and Sir HENRY LINGEN once extolled the
“ cider of Eliots, as rightly bedewing the glaſs like beſt Canaries; and full hogſheads
“ of the ſtockin apple have been tried amongſt us, but diſappointing our
“ expectation, though perchance by evil ordering: yet Mr. GRITTON highly
“ boaſted a mixture of ſtockin-apples and May-pears, tried (as I take it) by himſelf.
“ After many years trials of thoſe and many other kinds, the red-ſtreak
“ carried the common fame, and from moſt of thoſe reduced admirers.

8 “ I did once preſerve the jennet-moyle cider, but had only the ladies on my
“ ſide, as gentler for their ſugery palates, and for one or two ſober draughts; but
“ I ſaw cauſe to recant, and to confeſs the red-ſtreak to warm and whet the ſtomach,
“ either for meat or more drink.

9. “ The right cider-fruit is far more ſucculent, and the liquor more eaſily divides
“ from the pulp of the apple, than in beſt table-fruit, in which the juice
“ and the pulp ſeem friendly to diſſolve together on the tongue's end.

10. “ The liquor of beſt cider-fruit in the apple, in beſt ſeaſon of ripeneſs, is “ more briſk and ſmart that that which proves duller cider: and generally the “ fierceſt pears and a kind of tamer crabs (and ſuch was the red-ſtreak called in “ my memory) makes the more winy cider.

11. “ PALLADIUS denieth perry to bear the heat of ſummer; but there is a “ pear in Boſbury or thereabouts, which yields the liquor richer the ſecond year “ than the firſt; and ſo by my experience very much amended the third year. “ They talk much higher, but that is beyond my account.

12. “ As cider is for ſome time a ſluggard, ſo by like care it may be retained “ to keep the memorials of many conſuls; and theſe ſmoaky bottles are the nappy “ wine. My lord SCUDAMORE ſeldom fails of three or four years; and he is nobly “ liberal to offer the trial.

13. “ As red apples, ſo red pears (and amongſt them the red horſe-pear, next “ to the Boſbury) have held out beſt for the ſtomach and durance: but pears do “ leſs gratify the ſtomach than apples.

14. “ The ſeaſon of grinding theſe harſh pears is after full maturity, not till “ they have dropt from the tree, and there lain under the tree, or in heaps, a week “ or thereabouts.

15. “ And ſo of cider-apples, as of grapes; they require full maturity, which “ is beſt known by their natural fragrancy: and then alſo, as ripe grapes require “ a few mellowing days, ſo do all apples; as about a week or little more, ſo they “ be not bruiſed, which ſoon returns to rottenneſs; and better ſound from the “ tree, than rotten from the heap.

16. “ That due maturity and ſome reſt on the heap make the liquor taſte rather “ of apples, than winy, hath no more truth (if the cider be kept to fit age) than “ that very old cheeſe doth taſte of a poſſet.

17. “ The harſher the wild fruit is, the longer it muſt lie on heaps. For of the “ ſame fruit, ſuddenly ground, I have taſted good verjuice: but on heaps till near “ Chriſtmas, all good fellows called it Rheniſh-wine.

18. “ The grinding is ſomewhat conſiderable, rather too much than too little. “ Here I ſee a mill in Somerſetſhire, which grinds half a hogſhead at a griſt; and “ ſo much the better ground for the frequent rolling.

19. “ Soon after grinding it ſhould be preſt, and immediately be put into the “ veſſel, that it may ferment before the ſpirits be diſſolved; and then alſo in fermenting time, the vent-hole ſhould not be ſo wide, as to allow a prodigal waſte “ of the ſpirits; and as ſoon as the ferment begins to allay, the veſſels ſhould be “ filled of the ſame and well ſtopped.

20.

20. " Of late it is much commended, that before it be preſſed, the liquor and muſt ſhould for twenty-four hours ferment together, in a vat for that purpoſe covered, as ale or beer in the yeſt-vat, and then tunned up. This is ſaid to inrich the liquor, and to give it ſomewhat of the tincture of ſome red apples, as I have ſeen, and very well approved.

21. " As ſulphur hath ſome uſe in wines, ſo ſome do lay brimſtone on a rag, and by a wire let it down into the cider-veſſel, and there fire it; and when the veſſel is full of the ſmoke, the liquor ſpeedily poured in ferments the better. I cannot condemn this, for ſulphur is more kind to the lungs than cider; and the impurity will be diſcharged in the ferment.

22. " Apples overlong hoarded before grinding will for a long time hold the liquor thick; and this liquor will be both pleaſant, and, as I think wholeſome: and we ſee ſome rich wines of the latter vintage, and from Greece, retain a like craſſitude; and they are both meat and drink.

23. " I have ſeen thick harſh cider, the ſecond ſummer, become clear and very richly pleaſant; but I never ſaw clear acid cider recover.

24. " Wheat or leaven are good and kind in cider, as in beer; juniper-berries agree well and friendly for coughs, weak lungs, and the aged; but not at firſt for every palate. The moſt infallible and undiſcerned improver is muſtard; a pint to each hogſhead bruiſed, as for ſauce, with a mixture of the ſame cider, and applied as ſoon as the veſſel is to be cloſed after fermenting.

25. " Bottling is the next improver, and proper for cider. Some put two or three raiſins into every bottle, which is to ſeek aid from the vine. Here in Somerſetſhire, I have ſeen as much as a walnut of ſugar, not without need for this country cider.

26. " Crabs do not haſten the decay of perry, but preſerve it, as ſalt preſerves fleſh. But pears and crabs being of a thouſand kinds, require more aphoriſms.

27. " Neither wheat, leaven, ſulphur, nor muſtard are uſed but by very few, and therefore are not neceſſary to make cider laſt well for two, three, or four years.

28. " The time of drawing cyder into bottles is beſt in March, it being then clarified by the winter, and free from the heat of the ſun.

29. " In drawing, the beſt is neareſt the heart or middle of the veſſel, as the yolk in the egg.

30. " Red-ſtreaks are of divers kinds, but the name is in Herefordſhire appropriated to one kind, which is fair and large, of a high purple colour, the ſmell never aromatical, the tree a very ſhrub, ſoon bearing a full burthen, and ſeldom or

" failing till it decays, which is much ſooner than other apple-trees. 'Tis lately ſpread all over Herefordſhire; and he, that computes ſpeedy return and true wine, will think of no other cider-apple till a better be found.

31. " I ſaid, the red-ſtreak is a ſmall ſhrub; it is of ſmall growth, where the cider proves richeſt, for aught we have yet ſeen in Herefordſhire, *viz.* in light quick land: and if the land be very dry, jejune and ſhallow, that and other cider-fruit (eſpecially the jennet-moyle) will ſuſpend the ſtore of fruit alternatively every other year, except ſome blaſts or ſurpriſing froſts in the ſpring alter that method; for two bad years come ſeldom together, very rarely three.

32. " In good ſoil, I mean of common field (for fat land is not beſt for cider-fruit, but common arable) I have ſeen the trees of good growth, almoſt equalling other cider-trees, the apples larger, and ſeldom failing of a full burthen: thus in the vales of wheat lands, in ſtony globe or clay, where the cider is not ſo much extolled. But ſtill ſack is ſack, and canary differs from claret; ſo does red-ſtreak cider of the vale excel any other cider of the forcible ſoil.

33. " Yet this diſtinction of the ſoil requires much expefience and great heed, if we inſiſt upon accurate directions. For, as LAURENBERG ſaith, *in pingui ſolo non ſeruntur omnia rectè, neque in macro nihil.* And for gardens, flowers and orchards, I would chooſe many times ſuch lands, as do not pleaſe the huſbandman either for wheat or ſweet paſture, which are his chief aims. And thus LAURENBURG, *In arida & tenui terra felicius proveniunt ruta, allium, petroſelinum, crocus, hyſſopus, capparis, lupini, ſatureia, thymus. Arbores quoque tenue & macilentum ſolum amant; itemque frutices plerique,* * * * *arbores ſcilicet, pomi, piri, ceraſus, prunus, perſica, cotonea, mori, juglans, coriſti, ſtaphylodendrum, meſpilus, ornus, caſtanea, &c. Frutices ſcil. vitis, berberis, geniſta, juniperi, oxiocantha, periclymenum, roſa, ribeſium, uva, ſpina, vaccinia, &c.*

34. " But here alſo we muſt diſtinguiſh, that pears will bear in a very ſtony, hungry, gravely land, ſuch as apples will not bear in; and I have ſeen pears bear in a tough, binding, hungry clay, when apples could not ſo well bear it, (as the ſmooth rinds of the pear-trees, and the moſſy and cankered rinds of the apples did prove) the root of a pear-tree being, it ſeems, more able to pierce a ſtony and ſtiff ground. And cherries, mulberries, and plums can rejoice in a richer ſoil, though by the ſmalneſs of the roots the ſhallower ſoil will ſuffice them. And * * * require a deeper ground, and will bear with ſome degrees of hungry land, if they be ſupplied with a due meaſure of ſucculency or neighbouring moiſture: and the other ſhrubs, according to the ſmalneſs of their roots, do generally bear a thinner land. And I have ſeen a ſoil ſo much too rank for apples and plums, that all their fruit from year to year were always worm-eaten, till their lives were forfeited to the fire.

35. " To take up from theſe curioſities the moſt uſeful reſults to our purpoſe, we have always found thoſe orchards to grow beſt, laſt longeſt, and bear moſt, which are frequently tilled for barley, wheat, or other corn, and kept (by culture

“ and ſeaſonable reſt) in due ſtrength to bear a full crop. And therefore, whereas the red-ſtreak might otherwiſe without much injury be planted at fifteen or twenty foot diſtance, and the beſt diſtance for other cider-fruit hath heretofore been reputed thirty or thirty-two foot; very good huſbands do now allow their largeſt encloſures (as of twenty, forty, or a hundred acres) fifty or ſixty foot diſtance, that the trees may not much hinder the plough, and yet receive the benefit of compoſt. And a horſe-team well governed will (without any damage of danger) plough cloſe to the trees.

36. “ In ſuch ſoil as is here required, namely, of good tillage, an orchard of graffed red-ſtreaks will be of good growth and good burthen within ten or twelve years, and branch out with good ſtore to begin an encouragement at three years graffing; and (except the land be very unkind) will not yield to any decay within ſixty or eighty years, which is a man's age.

37. “ In ſome ſheets I rendered many reaſons againſt Mr. Austen of Oxford, why we ſhould prefer a peculiar cider-fruit, which in Herefordſhire are generally called muſts (both the apple and the liquor and the pulp together in the contuſion) as from the Latin *Muſtum*, white muſts of divers kinds, red cheekt and red-ſtreakt muſts of ſeveral kinds, green muſts, called alſo green fillet, and blue-ſpotted: why, I ſay, we ſhould prefer them for cider before table-fruit, as pippins, pear-mains, *&c.* And I do ſtill inſiſt on them; 1ſt, The liquor of theſe cider-fruit, and of many kinds of auſtere fruit, which are no better than a ſort of full ſucculent crabs, is more ſprightful, briſk and winy. For eſſay, I ſent up many bottles to London, that did me no diſcredit. 2dly, One buſhel of the cider-fruit yields twice or thrice as much liquor. 3dly, The tree grows more in three or four years, than the other in ten years, as I oftentimes remarked. 4thly, The tree bears far greater ſtore, and doth more generally eſcape blaſts and froſts of the ſpring. I might add, that ſome of theſe, and eſpecially ſuch pears as yield the beſt perry, will beſt eſcape the hand of the thief, and may be truſted in the open field.

38. “ By the firſt, ſecond, and fourth of theſe reaſons, I muſt exclude the jennet-moyle from a right cider-fruit, it being dry, and very apt to take froſty blaſts; yet it is no table-fruit, but properly a baking-fruit, as the ruddy colour from the oven ſhews.

39. “ I ſaid, that the right cider-fruit, generally called muſts, and deſerving the Latin name *Muſtum*, is of divers kinds; and I have need to note more expreſsly, that there is a red-ſtreak muſt (as I have often ſeen, but not generally known, that is quite differing from the famous red-ſtreak, being much leſs, ſomewhat oblong, and like ſome of the white muſts in ſhape, and full of a very good winy liquor. I could willingly name the perſons and place, where the diſtinct kinds are beſt known. It was firſt ſhewed me by John Nash, of Aſhperton in Herefordſhire; and for ſome years they did in ſome places diſtinguiſh a red-ſtreak, as yielding a richer red-ſtreakt cider, of a more fulvous or ruddy colour: but this difference (as far as I could yet find) is but a choice of a better inſolated or

“ more ruddy ſruit, of the beſt kind, as taken from the ſouth part of the tree, or from a ſoil that renders them richer. But my lord SCUDAMORE's is ſafely of the beſt ſort; and Mr. WHINGATE of the Grainge, in Democ, and ſome of King's-Chapel, do beſt know theſe and other differences: ſtreaked muſt, right red-ſtreakt, red red ſtreakt.

40. “ The greeniſh muſt, (formerly called in the language of that country the green fillet) when the liquor is of a kindly ripeneſs, retains a greenneſs equal to the Rheniſh glaſs; which I note for them, that conceive no cider to be fit for uſe till it be of the colour of old ſacks.

41. “ To direct a little more caution for inquiry of the right red-ſtreak, I ſhould give notice, that ſome months ago Mr. PHILIPS of Mountague in Somerſetſhire ſhewed me a very fair large red-ſtreak apple, that by ſmell and ſight ſeemed to me, and to another of Herefordſhire then with me, to be the beſt red-ſtreakt: but when we did cut it and taſte it, we both denied it to be right (the other with much more confidence than myſelf). But Mr. PHILIPS making cider of it, this week invited me to it, aſſuring, that already it excels all high country wine; and he wants not a diſcerning palate for wines. It had not ſuch plenty of juice as our red-ſtreaks with us, and it had more of the pleaſantneſs of table-fruit, which might be occaſioned (for aught I know) by the richer ſoil.

42. “ I may now aſk, why we ſhould talk of other cider-fruit or perry, if the beſt red-ſtreak have all the aforeſaid pre-eminences of richer and more winy liquor, be half ſooner an orchard, more conſtantly bearing, &c. An orchard of red-ſtreaks is commonly as full of fruit at ten years, as other cider-fruit at twenty years, or as the pippin or pear-main at thirty, or thereabouts.

43 “ But all ſoils bear not apples; therefore for perry, which is the goodlier tree for a grove, to ſhelter a houſe and walks from ſummer's heat and winter's cold winds, and far more laſting, the pleaſanteſt cider-pear of a known name amongſt them is the horſe-pear. And it is much argued, whether the white horſe-pear or red horſe-pear is the better; where both are beſt, within two miles they differ in judgment: the pear bears almoſt its weight of ſprightful winy liquor; and I always preferred the tawny or ruddy horſe-pear, and generally that colour in all pears, that are proper for perry.

44. “ I recited PALLADIUS againſt the durableneſs of perry; his words are, *Hieme durat, ſed primâ aceſcit æſtate.* Tit. 25. Febr. Poſſibly ſo of common pears, and in hotter countries. But from good cellars I have taſted a very briſk, lively, and winy liquor of theſe pears during the end of ſummer. And a Boſbury pear I have named and often tried, which without bottling in common hogſheads of vulgar and indifferent cellars, proves as well pleaſanter, as richer the ſecond year, and yet alſo better the third year. A very honeſt, worthy, and witty gentleman of that neighbourhood would engage to me, that in good cellars, and in careful cuſtody, it ſurpaſſeth any account of decay, and may be heightened to a kind of aquavitæ. I take the information worthy the ſtile of our

“ modern improvements. This pear-tree grows in common fields, and wild ſtony
“ ground, to the largeneſs of bearing one, two, three or four hogſheads each tree.

45. “ This Boſbury tree, and ſuch generally as bear the moſt laſting liquor and
“ winy, is of ſuch unſufferable taſte, that hungry ſwine will not ſmell to it; or if
“ hunger tempt them to taſte it, at firſt cruſh they ſhake it out of their mouths (I
“ ſay not this of the horſe-pear): and the clowns call other pears of beſt liquor
“ choak-pears; and will offer money to ſuch, as dare adventure to taſte them, for
“ their ſport: and their mouths will be more ſtupefied, than at the root of Wake-
“ robin.

46. “ A row of crab-trees will give an improvement to any kind of perry; and
“ ſince pears and crab-trees may be of as many kinds as there are kernels or differ-
“ ent kinds or mixtures of ſoils; in a general character I would prefer the largeſt
“ and fulleſt of an auſtere juice.

47. “ Mr. Lill of Marole (aged about ninety years) ever obſerved this rule,
“ to graffe no wild pear-tree till he ſaw the fruit; if it proved large, juicy, and
“ briſk, it failed not of good liquor. But I ſee cauſe to ſay, that to graffe a young tree
“ with a riper graffe, and known excellency, is a ſure game, and haſtens the return.

48. “ Mr. Speke (laſt high ſheriff of Somerſetſhire) ſhewed me in his park
“ ſome ſtore of crab-trees, of ſuch huge bulk, that in this fertile year, he offered a
“ wager, that they would yield one or two hogſheads of liquor each of them; yet
“ were they ſmall dry crabs.

49. “ I have ſeen ſeveral ſorts of crabs (which are the natural apple, or at worſt
“ but the wild apple) which are as large as many ſorts of apples, and the liquor
“ winy.

50. “ I have diſclaimed the guſt of juniper-berries in cider; I tried it only once
“ for myſelf, and drank it before Chriſtmas: poſſibly in more time, the reliſh had
“ been ſubdued or improved, as the hops in ſtale beer, and of runnet in good Parma-
“ ſan. Neither was the guſt to me otherways unpleaſant, than as aniſeeds in bread,
“ rather ſtrange than odious, and by cuſtom made grateful; and it did haſten the
“ clarification, and increaſed the briſkneſs to an endleſs ſparkling. Thus it in-
“ dulgeth the lungs, and nothing more cheap: where juniper grows, a girl may
“ ſpeedily fill her lap of the berries.

51. “ Cider being windy before maturity, ſome, that muſt not wait the leiſure
“ of beſt ſeaſon, do put ſprigs of roſemary and bays into the veſſel; the firſt, good
“ for the head, and not unpleaſant; the ſecond, an antidote againſt infections, but
“ leſs pleaſant till time hath incorporated the taſtes.

52. “ And why may we not make mention of all theſe mixtures, as well as the
“ ancients of their *vinum marrubii, vinum abrotonites, abſinthites, hyſſopites, mara-*
“ *thrites, thymites, cydonites, myrtites, ſcillites, viblaccum, ſorbi,* &c.

53.

53. "And for mixtures, I think we may challenge the antients in naming the "red raſpy, of which there is in this country a lady that makes a bonetta, the "beſt of ſummer-drinks And more yet, if we name the clove-gilly-flower, or "other gilly-flowers, a moſt grateful cordial, as it is infuſed by a lady in Staf-"fordſhire of the family of the Devereux's, and by ſome ladies of this country.

54. "I could alſo give ſome account of cherry-wine, and wine of plums. Their "vaſt ſtore in ſome places, under a penny the pound, and their expeditious "growth, make it cheap enough: and as in the other, ſo in theſe, the large "Engliſh or Dutch ſharp cherry, and the full black tawny plum, as big as a "walnut (not the kinds of heart cherries, nor the plum which divides from the "ſtone) make the wine. Their cheapneſs ſhould recommend them to more ge-"neral uſe at tables, when dried (an eaſy art) and then wholſomer.

55. "To return to redſtreak; it is a good drink, as ſoon as well fermented, or "within a month; better after ſome froſts, and when clarified; rich wine, when "it takes the colour of old ſack. In a good cellar, improves in hogſheads the "ſecond year. In bottles and ſandy cellars, keeps the records of late revolutions "and old mayoralties. Quære the manner of laying them up in ſand-houſes.

56. "I tried ſome bottles all a ſummer in the bottom of a fountain; and I "prefer that way where it may be had: and it is ſomewhat ſtrange, if the land "be neither dry for a ſand-houſe, nor fountainous for this better expedient.

57. "I muſt not preſcribe to other palates, by aſſerting how good cider may "be made, or to compare it with wines; but when the late king, of bleſſed "memory, came to Hereford in his diſtreſs, and ſuch of the gentry of Worceſter-"ſhire, as were brought thither as priſoners, both king, nobility, and gentry, did "prefer it before the beſt wines thoſe parts afforded; and, to my knowledge, that "cider had no kind of mixtures; and generally all the gentry of Herefordſhire "do abhor all mixtures."

Dr. GODDARD was deſired to bring in the experiment of LINUS, about the ſticking of the finger to the tube, that is leſs than 29½ inches; as alſo that of forcing water out of certain glaſs veſſels, by its own vapour, raiſed in it by hot water.

Dr. WILKINS undertook to inform the ſociety concerning Mr. TOWGOOD's ſucking pump raiſing water 42 foot high.

Dr. MERRET gave in his obſervations concerning the ordering of wines; the reading of which was deferred till the next meeting.

December 17. The experiment of expanding the air from the ſpirit of wine was made, and agreed very nearly with the account given in by Mr. HOOKE in writing concerning it.

Dr. Merret ſhewed ſome oil of vitriol frozen, and keeping a ſharp taſte.

Sir Robert Moray mentioned, upon the authority of Monſ. Huygens, an experiment of infrigidating luke-warm water; which, according to that writer's deſcription, was firſt ſeen to contract itſelf into a leſs room, and afterwards to dilate, ſo as to run over; many great bubbles ariſing out of the water to the top, and there breaking; which were followed by many little ones, ſome of which were ſeen to ſtick here and there to the ſides of the glaſs.

Mr. Hooke brought in his account of the diverſity of the parts of common water, which was ordered to be regiſtered[g], as follows:

" I took common water, and putting it into a retort, I diſtilled over a ſmall " quantity of it with a gentle fire in a ſand-furnace: then taking that, which was " diſtilled over, and ſome of what remained behind in the retort, with a very " exact pair of ſcales, I examined the weight of either apart, and found that, which " was come over, ſomewhat lighter than that which was behind, though the difference were not very great. Then I weighed common water undiſtilled, and " ſnow-water, that I carefully gathered, melted, and left to cool and ſettle. And " after all, I tried alſo the weight of ſome May-dew, and found (after I had diligently examined, that all things requiſite to this experiment were in a good " order, and that I had made my trials twice or thrice) that the weight of theſe " ſeveral liquors were in theſe proportions to each other:

" The weight	Of common water undiſtilled - -	$124\frac{5}{16}$
	Of the caput mortuum of common water after diſtillation - - - -	$124\frac{5}{16} \times \frac{1}{64}$
	Of the ſpirit or diſtilled water - -	$124\frac{4}{16}$
	Of the May-dew - - - -	$124\frac{6}{16}$
	Of the ſnow-water - - - -	$124\frac{3}{16}$

" And this I did after I had found (by equally expoſing the liquors to the cool " air, and then making trials with a very accurate weather-glaſs; that the ſeveral " liquors were very near of the ſame temperature, as to heat and cold: I ſay very " near, becauſe I found the ſnow-water, for the moſt part, ſomewhat cooler " than any of the reſt.

" Theſe trials do ſeem to inform us, either that the parts in common water, " before diſtillation, are of a different ſubtilty; and that therefore thoſe, which are " more light and volatile are, by a more gentle heat, eaſier raiſed up into the form " of vapours, and carried over the helm: or, that the parts of common water, " if uniform and homogeneous before diſtillation (that is, before they have been " by heat tranſmuted into the form of vapours) are, after diſtillation, put into " another condition; and are altered themſelves, as to their magnitude or motion,

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[g] Original Regiſter, vol. ii. p. 22.

" and ſo become more light and volatile: or, are put into a new texture, as to one " another, and thereby conſtitute a liquor much more light and porous. Which way " ſoever therefore of theſe two we incline to, it will ſeem to hint to us a difference " in the conſtituent parts of common water, as to their greater or leſs volatility: for " ſince it is generally believed, that a great part of the waters near the ſurface of " the earth deduce its origin from the ſky, whence it is imparted to the earth, " ſometimes in dews, ſometimes in miſts, rains, fogs, ſnows, hail, and the like; " it will follow, that ſome of it has ſuffered a diſtillation. And becauſe we find, " that common water is heavier than either diſtilled water, ſnow-water, or dew; " it follows alſo, that either ſome parts of it (ſuch as may perhaps be of a ſluggiſh nature themſelves, or, though of themſelves volatile, may be clogged with " ſaline or terreſtrial particles); it follows, I ſay, that ſome parts have not ſuffered a diſtillation; or have, ſince their return to the earth, acquired a new " conſtitution, by uniting perhaps with one another, or with ſome ſaline and terreſtrial parts.

" In the experiment therefore, where abundance of bubbles are obſerved to " ariſe out of the water, after the preſſure of the air is removed, I ſee not why " the generation of theſe bubbles may not in part be aſcribed to the more ſubtil " parts of the water, which, when the preſſure of the air is removed, are able to acquire the form of vapours, by that ſmall heat which is left in the ambient air; " and may, after they have acquired a new texture, have alſo a power of perſiſting " in it, as was obſervable in the remaining expanſion of ſpirit of wine, after the " preſſure of the air was re-admitted, and that of the factitious air generated by " the corroſion of iron in Mr. BOYLE's experiments.

" It is worth the obſerving further in theſe experiments, that May-dew, commonly accounted the lighteſt and moſt volatile of all waters, is yet, by this experiment, found to be no lighter than common diſtilled water, and heavier " than ſnow-water; and it argues ſomewhat for the former opinion, of the differing of the parts of water as to volatility; for May-dew, as we have no argument to believe it raiſed very high, ſo has it the heat of ſummer to raiſe it; " whereas ſnow, as we are aſſured it deſcends ſometimes from a conſiderable height, " ſo it has a more languid heat, *viz.* that of the winter air, to raiſe it."

Mr. HOOKE communicated likewiſe ſome remarks on the figures in frozen urine, frozen water, and ſnow; and thoſe of the ſmall ſhootings of hoar-froſts; which were ordered to be regiſtered [h].

He was appointed curator of three experiments againſt the next meeting:

1. Of weighing aſcending and deſcending bodies in water.

2. Of weighing ſome bodies at the top of Weſtminſter-abbey, and at the foot of it.

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[h] Ibid. p. 59, 69. They are printed in his *Micrographia*, p. 83—93.

3. Of forcing water out of a glaſs by its own vapours.

Dr. GODDARD's account of his experiment of exhalation raiſed from water, and returning to water again, was read, and ordered to be regiſtered [i], and was as follows:

" There was taken a ſpherical glaſs, containing about a pint, with a ſhort neck: this was placed on a little leaden trivet, with the mouth downward, and tied faſt; and then ſo put into a veſſel of water of convenient bigneſs and depth, with the mouth upward, that it might fill with the water. Then it was turned under water, ſo that no air could get in, and, with the mouth downward, ſet with the legs of the trivet on the bottom of the veſſel; which was covered, and ſo all ſet a boiling on a quick fire as vehemently as might be, without boiling over. Uncovering and looking in, one might perceive the glaſs to empty by degrees from the top, and after long and vehement boiling, with ſome difficulty, becauſe of the ſteams and leſs tranſparency of the boiling water, but at certainty one might diſcern the glaſs to be wholly or very near empty to the bottom, and the water riſing in an hill againſt the mouth of it; which it ſuddenly doth upon that cooling, which the uncovering of the veſſel occaſioneth, and almoſt filleth the glaſs; but what remaineth empty, will be long a filling till all be quite cold. The glaſs was entirely full of water, without any bubble of air; only there was a ſmall heterogeneous matter, not ſo much as a barley-corn, againſt the middle of the upper part of the glaſs, which was not regularly round as a bubble, nor did move upon turning of the glaſs, but ſtuck, and appeared to be ſome little ſcum or foulneſs, which the water might gather from the veſſel, trivet, *&c.*"

The letter drawn up by Dr. WILKINS, to be ſent to Sir WILLIAM PETTY from the ſociety, was read, approved, and ordered to be written fair, and to be diſpatched for Ireland by the next poſt.

Col. TUKE brought in his hiſtory of the generation and ordering of green oiſters, commonly called Colcheſter oiſters; which was read, and ordered to be regiſtered [k].

Mr. HOSKYNS brought in ſome inquiries to be ſent to Greenland; which were regiſtered [l], and are as follows:

" If the cold be as great or greater, between 60 and 70 degrees of north latilatitude, than between 70 and 80?

" If when wine or beer is frozen, the ice melted affords an inſipid watery liquor?

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[i] Original Regiſter, vol. ii. p. 63.

[k] Ibid. p. 64. It is printed in Dr. SPRAT's Hiſt. of the Roy. Soc. p. 307.

[l] P. 76.

" How deer and other beaſts do to live, while the ground is covered with ſnow?

" Whether the ice, that ſometimes troubles the ſhips, be ſea-water or river-water " frozen; and whence it comes driven by winds, and carried by currents?

" How they dreſs the ſkins of beaſts, fiſh, and fowl, with hairs and feathers " on?

" Whether they have obſerved the ſame variation to be there now, as in former " times? and if not, what difference?

" That they try the water-glaſs?

" What time the ſun riſeth and ſetteth apparently?"

He was likewiſe deſired to collect ſome for Iceland againſt the next meeting; to which ſhould be added a ſealed up thermometer, to mark the degree of cold in that country above that of England.

Dr. CHARLTON promiſed to communicate to the next meeting his obſervations upon the ordering of wines.

Mr. WILDE was deſired to add his obſervations upon the ſame ſubject.

Dr. MERRET's obſervations on it were read, and ordered to be regiſtered [m]; and were as follow:

" The myſtery of wines conſiſts in the making and meliorating of natural " wines. Melioration is either of ſound or vicious wines. Sound wines are bet" tered, 1ſt, by preſerving; 2dly, timely fining; 3dly, by mending colour, ſmell, " or taſte.

" To preſerve wines, care muſt be taken, that after the preſſing they may " ferment well; for without fermentation they become qually, *i. e.* cloudy, thick, " and duſky; and will never fine of themſelves, as other wines do; and when " they are fined by art, they muſt be ſpeedily ſpent, or elſe they will become " qually again, and then by no art recoverable.

" The principal impediments of the fermentation of wines, after preſſing the " grapes, are either their unripeneſs when gathered, or the mixture of rain-water " with them, as in wet vintages; or elſe through the addition of water to rich " grapes. The Spaniards uſe *gieſſo*, to help the fermentation of their Canary " wines.

" To preſerve Spaniſh wines, and chiefly Canary. and thereof principally that " that which is racy, which will not keep ſo long, they make a layer of grapes

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[m] Original Regiſter, vol. ii. p. 67.

“ and gieſſo, whereby it acquires a better durance and taſte, and a white colour, moſt pleaſing to the Engliſh.

“ Racy wine, ſo called, becauſe it comes from Rheniſh wine ſlips, ſometimes renewed. The grape of this wine is fleſhy, yielding but a little juice.

“ French and Rheniſh wines are chiefly and commonly preſerved by the match; thus uſed at Dort in Holland: Take of brimſtone twenty or thirty pounds, caſt into it melted, ſpices, as cloves, cinnamon, mace, ginger, and coriander ſeeds; and ſome, to ſave charges, uſe the relick of the hippocras bag; and having mixed theſe well with the brimſtone, they draw through this mixture, long, ſquare, narrow pieces of canvas; which pieces, thus drawn through the ſaid mixture, they light, and put into the veſſel at the bung-hole, and preſently ſtop it cloſe. Great care is to be had in proportioning the brimſtone to the quantity and quality of the wine; for too much makes it rough. This ſmoking keeps the wine long white and good, and gives it a pleaſant taſte.

“ There is another way for French and Rheniſh wine, *viz.* firing it: it is done in a ſtove, or elſe a good fire made round about the veſſels, which will gape wide, yet the wine runs not out. It will boil, and afterward may be ſoon racked.

“ Secondly, for timely fining of wines. All wines in the muſt are more opacous and cloudy. Good wine ſoon fines, and the groſs lees ſettle quickly; and alſo the flying lees, of themſelves, in time. When the groſs lees are ſettled, they draw off the wine, called racking. The uſual times for racking are Midſummer and Alhallowtide.

“ The practice of the Dutch and Engliſh, to rid the wine of the flying lees ſpeedily, and which ſerves moſt for French and Spaniſh wine, is thus performed: Take of iſinglaſs half a pound, ſteep it in half a pint of the hardeſt French wine that can be got, ſo that the wine may fully cover it; let them then ſtand twenty-four hours; then pull and beat the iſinglaſs to pieces, and add more wine, and four times a day ſqueeze it to a gelly, and as it thickens add more wine. When it is fully and perfectly gellied, take a pint or quart to a hogſhead, and ſo proportionably. Then over-draw three or four gallons of that wine you intend to fine, which mix well with the ſaid quantity of gelly; then put this mixture to the piece of the wine, and beat it with a ſtaff, and fill it top-full. Note, that French wine muſt be bunged up very cloſe, but not the Spaniſh; and that iſinglaſs raiſeth the lees to the top of ſtrong wines, but in weaker precipitateth it to the bottom.

“ They mend the colour of ſound clarets, by adding thereto red wine, tent, or Alicant; or by an infuſion of turnſole, made in two or three gallons of the wine; and then putting it into the veſſel, to be then (being well ſtopped) rolled for a quarter of an hour. This infuſion is ſometimes twice or thrice repeated, according as more colour is to be added to the wine. Some three

" hours infuſion of the turnſole is ſufficient, but then it muſt be rubbed and " wringed. What turnſole is, ſee the notes on the art of glaſs.

" Claret over red, is amended with the addition of white wine.

" White wines coming over ſound, but brown, are thus remedied: Take of " alabaſter powder, over-draw the hogſhead three or four gallons, then put this " powder into the bung, and ſtir and beat it with a ſtaff, and fill it top-full. The " more the wine is ſtirred, the finer it will come upon the lee, that is, the finer it " will be.

" To colour ſack white: Take of white ſtarch two pounds, of milk two gallons; boil them together two hours; when cold, beat them well with an handful of white ſalt, and then put them into a clean and ſweet but, beating them " well with a ſtaff; and the wine will be pure and white.

" One pound of the forementioned gelly of iſing glaſs takes away the brownneſs " of French and Spaniſh wines, mixed with two or three gallons of wine; according as it is brown and ſtrong, more or leſs to be uſed. Then over-draw the " piece of wine about eight gallons, and uſe the rod; and then fill the veſſel full, " and in a day or two it will fine and be white, and mend it if qually.

" The firſt buds on *ribes nigra* infuſed in wines, eſpecially Rheniſh, makes it " diuretic, and more fragrant in ſmell and taſte; and ſo doth clary. The inconvenience is, that the wine becomes more heady; a ſecret remedy whereof " are elder-flowers added to the clary; which alſo better the fragrancy thereof, " as is manifeſt in elder-vinegar: but theſe flowers are apt to make the wine " ropy.

" To help brown Malaga's and Spaniſh wines: Take powder of orris-roots and " ſaltpetre, of each four ounces; the whites of eight eggs; whereto add as much " ſalt as will make a brine; put this mixture into the wine, and mix them with " a ſtaff.

" To meliorate muddy and tawny clarets: Take of rain-water two pints, the " yolks of eight eggs, ſalt a handful; beat them well, let them ſtand ſix hours " before you put them into the caſk; then uſe the rod, and in three days it will " come to itſelf.

" To amend the taſte and ſmell of Malaga: Take of the beſt almonds four " pounds, make therewith, and with a ſufficient quantity of the wine to be cured, " an emulſion; then take the whites and yolks of twelve eggs; beat them together with ſalt a handful, put them into the pipe, uſing the rod.

" To amend the ſmell and taſte of French and Rheniſh, which are foul: Take " to an auln of the wine, of honey one pound, elder-flowers a handful, orris-powder an ounce, one nutmeg, a few cloves; boil them in a ſufficient quantity “of the wine to be cured, to the conſumption of half; when it is cold, ſtrain and uſe it with the rod. Some add a little ſalt. If the wine be ſweet enough, add of ſpirit of wine one pound to a hogſhead, and give the caſk a ſtrong ſcent. Spirit of wint makes any wine briſk, and fines it without the former mixture.

“A lee of the aſhes of vine branches, *viz.* a quart to a pipe, being beaten in the wine, cures the ropiſhneſs of it; and ſo infallibly doth a lee of oaken aſhes. For Spaniſh ropy wine; rack it from its lees into a new ſcented caſk, then take of allum one pound, orris-roots powdered half a pound; beat them well into the wine with a ſtaff. Some add fine and well-dried ſand, put warm to the wine. If the wine, beſides, prove brown, add three pottles of milk to a pipe. *Alias*, the ſpawn cures ropy wine, uſed before it begins to fret.

“Herrings roes preſerve any ſtum wine.

“To order Rheniſh wines when fretting: Commonly in June that wine begins to ferment and grow ſick; then have a ſpecial care not to diſturb it, either by removing, filling the veſſel, or giving it vent; only open the bung, which cover with a ſlate, and as often as the ſlate is foul, clean it and the bung from their filth; and when the fermentation is paſt, which you ſhall know by applying your ear to the veſſel, then give it reſt ten or twelve days, that the groſſer lees may ſettle; then rack it into a freſh ſcented caſk.

“This mixture meliorates vicious wines, both in ſmell and taſte, eſpecially French: Take of the beſt honey one part, of rain-water two parts, and one third of ſound old wine of the ſame kind; boil them on a gentle fire to a third part, ſcumming them often with a clean ſcummer; to which purpoſe they have a pail of fair water ſtanding by to rince it in; then put this mixture hot into a veſſel of fit capacity, and let it ſtand unbunged till cool. Some, to better this, put in a bag of ſpices. This mixture, called by the Dutch *Soet*, will ſerve alſo to fine any wine, new or old. 2dly, It will mend the hard taſte of wine *i. e.* putting a gallon thereof to a hogſhead, and uſing the rod, and then let it reſt five or ſix days at the leaſt: but if mild enough, add white muſtard-ſeed bruiſed.

“To mend and preſerve the colour of clarets: Take red beet roots a ſufficient quantity, ſcrape them clean, and cut them into ſmall pieces, then boil them in a ſufficient quantity of the ſame wine, to the conſumption of a third part; ſcum it well, and when cool, decant off what is clear, and uſe the rod.

“*Alias:* Take of the wine and honey of each two pounds, rain-water a pottle, twelve beet-roots, ripe mulberries four or five handfuls; boil them to half, and when cool, decant, *&c. ut ſupra.*

“To preſerve claret racked from its lees: Take, to a tierce, ten eggs, make a ſmall hole in the top of the ſhells, then put them into the wine, and all will be conſumed.

“ To prevent ſouring of French wines: Take grains of paradiſe, *q. ſ.* heat them in a pan, and hang them, or put them looſe into a veſſel. Some uſe lavender tops.

“ To help ſour French wine: Take of the beſt wheat four ounces, boiled in fair water till it break, and when cold put it into a vat, in a bag, and uſe the rod. *Alias*, Take five or ſix cinnamon canes, bung them up well.

“ To help Spaniſh ſour wine: Firſt rack the wine into a clean caſk, and fill it up with two or three gallons of water, and add thereto of burnt chalk four ounces, and after three or four days it muſt be rackt and filled up again with rain-water, if the firſt time doth not do it. Some uſe loam or plaiſtering; if theſe ingredients make the wine bitter, correct the fault with nutmegs and cloves.

“ To help ſtinking wines: Take ginger half an ounce, zedoary two drachms, powder and boil them up in a pottle of good wine, which put ſcalding hot into the vat, bung it up, and let it lie. The ſpecies of diambra and diamoſchu dulce do the ſame; and ſo nutmegs and cloves, which alſo give a kind of racineſs.

“ To help wine, that hath an ill ſavour from the lees: Firſt rack it into a clean caſk, and, if red or claret, give it a freſh lee of the ſame kind; then take of cloves, ginger, and cinnamon two ounces, orris-root four ounces, powder them groſsly, hang them in a bag, and taſte the wine once in three days, and when it is amended, take out the bag. Some do it thus: Take of cloves half a pound, maſtic, ginger, cubebs, of each two ounces, ſpica nardi three drachms, orris-root half a pound; make thereof a very fine powder, which put looſe into the vat, and uſe the rod; then make a good fire before it.

“ Firing of wines, in Germany, is thus performed. They have in ſome vaults three or four ſtoves, which they heat very hot; others make fires almoſt before every vat; by this means the muſt fermenteth with that vehemency, that the wine appears between the ſtaves: when this ebullition and fermentation and working ceaſeth, let the wine ſtand ſome days, and then rack it. This firing is only uſed in cold years, when the wine falls out green.

“ Stum is nothing elſe but pure wine kept from fretting, by often racking and matching it in clean veſſels and ſtrongly ſcented, *i. e.* new matched, by means whereof it becomes as clear, or clearer, than any other wine, preſerving itſelf from both its lees by precipitation of them. But if through neglect it once frets, it becomes good wine. The bung of the veſſel muſt be continually ſtopt, and the veſſels ſtrong, leſt they break. A little ſtum put to wine decayed makes it ferment a-freſh, and gives life and ſweetneſs thereto; but offends the head and ſtomach, torments the guts, and is apt to cauſe looſeneſſes, and ſome ſay barrenneſs in women.

“ To fine wine preſently. Fill a caſk with ſhavings or chips of beech or oak, which are beſt. This is to be done with much art, or elſe it ſeldom hits right,

“ but laſteth long: put theſe chips into a caſk, which is called by the Dutch *een*
“ *ſpaen*, i. e. a chip, into which they pour in as much wine as the caſk will hold,
“ and in twenty-four hours the wine will be fine. Or a quart of vinegar in three
“ days will fine a hogſhead of wine.

“ To ſet old wine a fretting, being deadiſh and dull in taſte: Take of ſtum
“ two gallons to a hogſhead, put it hot upon the wine, then ſet a pan of fire before
“ the hogſhead, which will then ferment till all the ſweetneſs of the ſtum is com-
“ municated to the wine, which thereby becomes briſk and pleaſant. Some uſe
“ this ſtumming at any time, ſome in Auguſt only: when the wine hath a diſpo-
“ ſition to fret of itſelf, more or leſs ſtum to be added, as the wine requires.

“ The beſt time to rack wine is the decreaſe of the moon, and when the wine is
“ free from fretting; the wind being at north-eaſt or north-weſt, and not at ſouth,
“ the ſky ſerene, free from thunder and lightning.

“ Another match for French clarets and Spaniſh wines: Take orris roots, ma-
“ ſtic and brimſtone, of each four ounces, cloves two ounces, ordering it *ut ſuprà*
“ in matching wines. This will ſerve for all wines, adding, if you pleaſe, nut-
“ megs, ginger, cinnamon, and other ſpices. Double the quantity of orris root is
“ to be uſed for Spaniſh wines.

“ To help Malaga's, which will not fine: Take crude tartar powdered, ſifted,
“ and dried two pounds, mix it with the whites of ſix eggs: dry, powder, and
“ ſift them again; then overdraw the pipe, as much as will ſerve to mix with this
“ powder, and fill the pipe therewith, beating it with a ſtaff, as before, and this
“ wine will be fine in ten days.

“ Another ſpeedy way to fine French wines: Hang a piece of ſcent in the caſk,
“ and when it is burnt out, put in a pint of the beſt ſpirit of wine, and ſtir it
“ about. Some add a little ſalt well dried. This fines the wine in twenty-four
“ hours.

“ To keep muſt a year: Take muſt, put it into a caſk pitched within and with-
“ out, half full, ſtop the bung cloſe with mortar. Others ſew the caſk in ſkins,
“ and ſink it for thirty days into a well or river; or elſe a garland of *polium mon-*
“ *tanum* hung in the veſſel; or rub the inſide of the veſſel with cheeſe. All theſe
“ preſerve Rheniſh muſt; as the *Scholiaſt on Dodonæus* in Dutch.

“ Allum, put into a hog's bladder, keeps wine from turning flat, faint or brown;
“ and beaten with the whites of eggs, removes its ropiſhneſs.

“ Flat wines recover with ſpirit of wine, raiſins, and ſugar or moloſſes; and
“ ſacks, by drawing them on freſh lees.

“ Our wine-coopers of later times uſe vaſt quantities of ſugar and moloſſes to
“ all ſorts of wines, to make them drink briſk and ſparkling, and to give them

" ſpirit, as alſo to mend their bad taſtes; all which raiſins and cute and ſtum " perform.

" Country vintners feed their fretting wines with raw beef; and here their Ca" naries with Malaga, which is added more or leſs to all Canaries.

" The compoſition of wines is manifold, the vintners uſually drawing out of " two or three caſks for one pint, to accommodate it to the palate of thoſe, that " drink it: moſt of the Canary is made with Malaga and Xeres ſack.

" I ſhall conclude with two common compounded wines, muſcadine and hippo" cras: the former uſually made with thirty gallons of cute (which is wine boiled " to the conſumption of half) to a but of wine, or the lees and droppings boiled " and clarified: its flavour is made of coriander-ſeeds prepared, and ſhavings of " cypreſs wood. Some, inſtead of cute, make it of ſugar, moloſſes and honey, or " mix them with the cute. The following is an hippocras of my own making, " and the beſt I have taſted:

" Take of cardamums, carpobalſamum, of each half an ounce; coriander-ſeeds " prepared, nutmegs, ginger, of each two ounces; cloves two drams; bruiſe and " infuſe them forty-eight hours in Xeres and white wine of each a gallon, often " ſtirring them; then add thereto of milk three pints; ſtrain through an hippo" cras bag, and ſweeten it with a pound of ſugar-candy."

Dr. MERRET reported, that the experiment brought in at the preceding meeting by Mr. OLDENBURG out of Gaſſendus, concerning the firm freezing of ice upon wood with ſome ſalt put upon the top of the ice, had been ſince made by him, and found true.

Sir ROBERT MORAY promiſed to communicate an account of the method of brewing ale and beer in Scotland; and propoſed, that the whole hiſtory of malting and brewing all ſorts of ale and beer might be conſidered. Whereupon Mr. HILL mentioned one Mr. PHILIPS as verſed in this ſubject, and fit to ſerve the ſociety herein; after proof of which he might be propounded as a candidate.

Sir ANDREW KING was propoſed as a candidate by Mr. GRAUNT.

Dr. CHARLTON informed the ſociety, that Mr. CREW intended to preſent them with an eagle embalmed after his manner; and that the parroquet, which he was deſired to embalm, was not ſo fit to be well done.

Mr. WINTHROP ſhewing the ſociety ſome Indian corn, ſome grains of which were bluiſh, promiſed to give them in writing the hiſtory of ordering it in the Weſt-Indies.

He ſhewed alſo the tail of a rattle-ſnake, which, he ſaid, increaſed every year by one ring; whence the people concluded the age. Dr. MERRET took it home with him, to make ſome trial of the powder of it.

Dr. Croune acquainted the ſociety with Dr. Collins's[n] offer to correſpond with them from Ruſſia; and he was deſired to entertain that correſpondence, and to peruſe Olearius for inquiries to be recommended to Dr. Collins.

December 24. Mr. Charles Howard was propoſed candidate by Col. Tuke, and was preſently choſen; his deſire being to be rather admitted by ſcrutiny, than by the privilege of his birth.

Sir Andrew King was likewiſe elected into the ſociety.

The experiment of weighing aſcending and deſcending bodies in water, and another of driving water out of a glaſs by its own vapours, were made before the ſociety by Mr. Hooke; who alſo brought in the following account in writing of the latter, which was ordered to be regiſtered[o].

“ In proſecution of Dr. Goddard's experiment, brought in *December* 17, 1662, “ I tried with ſmall bolt-heads blown in the flame of a lamp, and (though with “ much trouble) I made a ſhift to ſeal up ſome, after I had driven out the water “ by the vapours. One of theſe, after it was quite cold, I broke under water, “ and found it filled almoſt full, leaving but a ſmall bubble of air at the top, “ which bubble remained conſtantly in the form of air, and did not vaniſh. I “ drew out the water likewiſe out of others, and letting them cool, I always “ found, that there was left a pretty big bubble of air in the head, which remained “ ſo, though I left them ſtanding with their necks in the water for three or four “ days; but they ſeemed a little decreaſed. I tried the bigneſs of one of theſe “ bubbles, and found it, by a very exact pair of ſcales, to be the 312th part of “ the whole content of the bolt-head. The bubbles I gueſs may be generated “ partly from the water rarefied by heat, and partly from the ſudden removal of “ the preſſure of the air after the glaſs begins to cool, which makes the water ruſh “ in with a moſt admirable violence: I ſay partly from this laſt way, becauſe “ making trial with an open jar inverted into a ſkillet of water, I found the bubble “ of air left at the top, by gueſs, not ſo big in proportion to the contents of “ the jar, as the former were in reſpect of the bolt-head.”

He was deſired to communicate an account of the experiment of weighing aſcending and deſcending bodies, at the next meeting.

He gave in the following account of the experiment concerning the decreaſe of gravity, by removing the body farther from the ſurface of the earth upwards: which was ordered to be regiſtered[p].

“ In proſecution of my lord Verulam's experiment concerning the decreaſe of “ gravity, the farther a body is removed below the ſurface of the earth, I made

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[n] Samuel Collins, M. D. educated in King's College, Cambridge, of which he was fellow, as he was afterwards of New College in Oxford, where he was incorporated doctor of phyſic May 11, 1650, reſided at the court of the Czar of Muſcovy nine years, and publiſhed *The hiſtory of the preſent ſtate of Ruſſia*, at London 1671, in 8vo.

[o] Original Regiſter, vol. ii. p. 80.

[p] Ibid. p. 78.

“ trial, whether any ſuch difference in the weight of bodies could be found by their nearer or farther removal from that ſurface upwards. To this end I took a pair of exact ſcales and weights, and went to a convenient place upon Weſtminſter-Abbey, where was a perpendicular height above the leads of a ſubjacent building, which by meaſure I found threeſcore and eleven foot. Here counterpoiſing a piece of iron (which weighed about ſixteen ounces troy) and packthread enough to reach from the top to the bottom, I found the counterpoiſe to be of troy-weight ſeventeen ounces and thirty grains. Then letting down the iron by the thread, till it almoſt touched the ſubjacent leads, I tried what alteration there had happened as to its weight, and found, that the iron preponderated the former counterpoiſe ſomewhat more than ten grains. Then drawing up the iron and thread with all the diligence poſſibly I could, that it might neither get nor loſe any thing by touching the perpendicular wall, I found by putting the iron and packthread again into its ſcale, that it kept its laſt equilibrium; and therefore concluded, that it had not received any ſenſible difference of weight from its nearneſs to or diſtance from the earth. I repeated the trial in the ſame place, but found, that it had not altered its equilibrium (as in the firſt trial) neither at the bottom, nor after I had drawn it up again; which made me gueſs, that the firſt preponderating of the ſcale was from the moiſture of the air, or the like, that had ſtuck to the ſtring, and ſo made it heavier. In purſuance of this experiment, I removed to another place of the Abbey, that was juſt the ſame diſtance from the ground, that the former was from the leads; and upon repeating the trial there with the former diligence, I found not any ſenſible alteration of the equilibrium, either before or after I had drawn it up; which farther confirmed me, that the firſt alteration proceeded from ſome other accident, and not from the differing gravity of the ſame body.

“ I think therefore it were very deſirable, from the determination of Dr. Power's trials, wherein he found ſuch difference of weight, that it were examined by ſuch as have opportunity, firſt, what difference there is in the denſity and preſſure of the air, and what of that condenſation or gravity may be aſcribed to the differing degrees of heat and cold at the top and bottom, which may be eaſily tried with a common weatherglaſs and a ſealed-up thermometer: for the thermometer will ſhew what of the change is to be aſcribed to heat and cold, and the weatherglaſs will ſhew the differing condenſation. Next, for the knowing, whether this alteration of gravity proceed from the denſity and gravity of the ambient air, it would be requiſite to make uſe of ſome very light body, extended into large dimenſions, ſuch as a large globe of glaſs carefully ſtopt, that no air may get in or out: for if the alteration proceeded from the magnetical attraction of the parts of the earth, the ball will loſe but a ſixteenth part of its weight (ſuppoſing a lump of glaſs held the ſame proportion, that Dr. Power found in braſs) but if it proceed from the denſity of the air, it may loſe half, or perhaps more. Further, it were very deſireable, that the current of the air in that place were obſerved, as Sir Robert Moray intimated the laſt day Fourthly, I think it were worth trial to counterpoiſe a light and heavy body one againſt another above, and to carry down the ſcales and them to the bottom, and obſerve what happens. Fifthly, it were deſireable, that trials were made, by the letting down of

“ other both heavier and lighter bodies, as lead, quickſilver, gold, ſtones, wood,
“ liquors, animal ſubſtances, and the like. Sixthly, it were to be wiſhed, that
“ trial were made, how that gravitation does decreaſe with the deſcent of the body,
“ that is, by making trial, how much the body grows lighter at every ten or twenty
“ foot diſtance. Theſe trials, if accurately made, would afford a great help to
“ gueſs at the cauſe of this ſtrange phænomenon.”

Sir Robert Moray and Mr. Bruce made ſeveral relations of accidents, which happened in coal-mines; and were deſired to give them in writing.

Dr. Croune mentioned, that common water being carried to the Indies, and ſome of it brought back, flamed, when the veſſel, wherein it was contained, was opened.

Mr. Bruce and Mr. Pell were deſired to bring in the deſcription of the ſeveral wind-mills and water-mills, which they had obſerved in Holland and other parts, in order that it might be conſidered, how and wherein theſe engines ſhorten labour.

Dr. Merret was deſired to make the experiment mentioned by Sir Robert Moray out of Zucchius[q], concerning the contraction and dilatation in freezing water.

Dr. Charleton was deſired to deliver in Dr. Merret's papers concerning the ordering of wines, to be copied by the amanuenſis.

Mr. Hoskyns communicated his *Inquiries* to be ſent to Iceland, which were ordered to be regiſtered[r], and were as follows:

“ What ſorts of minerals, beſides brimſtone, are digged up near *Hecla*, or the
“ other burning mountains?

“ Whether in or near *Hecla* there be holes, which, if a ſtone be thrown into them,
“ throw it back again; and that in many places about the hill there will often
“ break out green flames; and whether fire breaks out of the ſea?

“ Whether there be ſeen in baths, whoſe heat is not ſufferable by one's hand,
“ divedoppers ſwimming up and down?

“ Whether there be a well, whoſe water is poiſonous, and kills preſently, being
“ drank; and what minerals it may proceed from?

“ Whether their meat only dried keeps as well as that which is ſalted?

“ On the weſt ſide of the iſle is ſaid to be a lake always ſmoaking, though cold;
“ into which if wood be thrown, it turns it to ſtone; but if the wood be thruſt

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[q] Nicolaus Zucchius, a jeſuit, born at Parma, who flouriſhed about the year 1651.

[r] Original Regiſter, vol. ii. p. 77.

" into the mud, that part, that was in the water, is ſtone; but what is in the mud,
" is like iron in ſight and hardneſs, but in the fire it burns.

" Near a place called *Haſnford* is ſaid to be a deep pit, into which if a ſtone be
" thrown, it is a long while falling, but after ſome time water boils out at top.

" Near the middle of the iſle is ſaid to be a lake, that kills the birds, that fly
" over it.

" Whether it be true, that they ſell winds, or converſe with ſpirits, or often ſee
" them?

" What is ſaid there concerning raining mice?"

Dr. GODDARD, Dr. WILKINS, and Sir ROBERT MORAY were deſired to bring in at the next meeting the experiment of LINUS about the ſticking of the finger to the tube, that is leſs than 29½ inches.

JOHN AUBREY, eſq; was propoſed as a candidate by Dr. CHARLETON.

Dr. POPE was deſired to make the diagram in great relating to Monſieur HUYGENS's Latin letter to Sir ROBERT MORAY, in anſwer to Mr. HOBBES's defence of his geometrical problems[a].

Mr. WINTHROP ſhewed an earth, brought by him out of New England, which ſwam for about half an hour, and then ſunk to the bottom.

December 31. Mr. CHARLES HOWARD was admitted.

Sir ROBERT MORAY and Mr. BRUCE promiſed to bring in writing their relation of coal-mines and wind-mills at the next meeting.

Mr. PELL promiſed to give an account in writing of his obſervations about wind-mills as ſoon as he could.

Dr. GODDARD gave an account of the mercurial experiment of LINUS, which had been recommended to him, Sir ROBERT MORAY, and Dr. WILKINS, it being made by himſelf in private, and before the ſociety, where the lord viſcount BROUNCKER likewiſe made it twice; and all the trials agreed in this, that, contrary to what Monſieur HUYGENS expected, the finger ſtuck faſt to the tube of mercury: the particulars of which Dr. GODDARD promiſed to give in writing.

Dr. CHARLETON had leave to keep for a fortnight Dr. MERRET's and Mr. WILDE's obſervations concerning the ordering of wines, in order to compare them with his own, to reduce them all into one body, and to return them to the ſociety.

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[a] Letter-book, vol. i. p. 72.

Monſieur Huygens's letter to Sir Robert Moray was read, containing his anſwer to Mr. Hobbes's defence of certain geometrical problems about the duplication of the cube, *&c.* And it was ordered to be ſent to Mr. Hobbes by the means of the ſtationer appointed by himſelf to receive the judgments of foreign mathematicians concerning that matter.

William Neile, eſq; was propoſed as a candidate by Sir Robert Moray.

Dr. Merret gave ſome account of the freezing of ſtinking ſalt-water, *viz.* that the ice of it being thawed, retained its ſaltneſs, though ſomewhat refracted; but had quite loſt its ſtink. He was deſired to be mindful of the other experiments of freezing recommended to him.

Mr. Boyle was alſo deſired to communicate his experiments of froſt, which he promiſed to do at his firſt convenience.

Mr. Hooke made again the experiment of weighing aſcending and deſcending bodies in water, but in another manner; and was deſired to bring to the next meeting an account of it in writing.

Mr. Wild promiſed to communicate an account of ferments.

Mr. Graunt delivered the extracts of two letters from Sir William Petty.

Mr. Hooke propoſed the following experiments to be made at the next meeting, *viz.*

1. To ſhew the difference in the refraction of warm water and cold;

2. The difference in the weight of warm water and cold;

3. The living of inſects in condenſed air:

To which he added a ſuggeſtion concerning the rarifying of chimnies, or the ways of ordering the cumbuſtible materials ſo, as that with a ſmaller conſumption of the fuel, a greater heat may be given, than is done by the common ways yet in uſe.

Mr. Pell mentioned an obſervation concerning the figure of the weight hung to a pendulum-clock, *viz.* that a leſs weight of a long figure will make a pendulum-clock to go, as well as a greater weight of a round figure.

Sir Robert Moray mentioned the uſe of black-lead in engines inſtead of oil.

Mr. Winthrop remarked, that there was no right black-lead any where except in England and New England.

He delivered in an account of maiz or Indian corn, which was ordered to be regiſtered[t].

166$\frac{2}{3}$. *January* 3. The preſident wrote in favour of the ſociety the following letter to the duke of ORMONDE, lord lieutenant of Ireland.

" MY LORD, January 3, 1662.

" I am deſired by the Royal Society in their names to entreat your grace's fa-
" vour and countenance in the effectual ſettlement of the fractions of adventures,
" arrears, lands *&c.* which by the act for the better execution of his majeſty's
" gracious declaration *&c.* were veſted in his majeſty, in truſt for, and the better
" to enable his majeſty to grant the ſame to them, ſo as his majeſty being their
" founder, might alſo be their chief benefactor. In purſuance whereof his majeſty
" was pleaſed, by his private letters under his own hand in October laſt, to re-
" commend the ſame unto you: and thereafter ſome, in the behalf of the clergy
" of that kingdom, made their application unto his majeſty for the ſame: But his
" majeſty well remembring his promiſe to grant the ſame to the ſociety, was
" pleaſed to put a ſtop unto thoſe addreſſes, and by his letters in the ſame month
" of October laſt, under his royal ſignet, was further graciouſly pleaſed to direct
" your grace to paſs a grant of the ſaid fractions unto Mr. ROBERT BOYLE and
" Sir ROBERT MORAY for the uſe of the ſaid ſociety. And underſtanding, that
" afterwards Sir ALLEN BRODERICK, Colonel WILLIAM LEGGE, and Mr. HENRY
" COVENTRY, without informing his majeſty of the intereſt of the ſociety, have
" procured letters to your grace to paſs grants of the ſaid fractions unto them,
" contrary unto the end, for which the ſame were originally deſigned, and his ma-
" jeſty's gracious intentions; the ſociety being much troubled thereat, and fearing,
" that the ſame might have been abſolutely paſſed the ſeal there before your grace
" could have been informed of the truth of the caſe, nothing doubting but that as
" you have been an eminent favourer to the ſociety in their foundation, you will
" be ſo far from obſtructing or diverting his majeſty's bounty or favour unto them,
" that you will contribute your intereſt to make the ſame effectual, much more
" where the intereſt of private perſons, though very deſerving, comes in competi-
" tion with the public concern of a ſociety, whoſe deſigns, if protected and aſſiſted
" by authority, may ſo much conduce to the greatneſs and honour of their prince,
" the real good of his dominions, and the univerſal benefit of mankind, and more
" eſpecially, where their right and pretenſions unto the thing in queſtion are every
" way more juſt and conſiderable than theirs, who would endeavour to gain the
" ſame of their hands.

" To prevent which, it was deſired, that Sir HENRY BENNET would procure
" his majeſty's letter unto your grace, to put a ſtop unto the ſaid grants, until
" his majeſty were fully informed of the caſe, wherein he was not ſo forward as
" was deſired: and therefore it was thought fit to acquaint the council of the ſaid
" ſociety therewith, who deſired me and others of the ſociety to ſollicit his ma-

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[t] *Original Regiſter, vol.* ii. *p.* 81.

[u] Supplement to the Letter-books, vol. i. p. 142.

"jeſty, not only to put a ſtop unto former grants, but alſo for an abſolute grant "of all the ſaid fractions to the uſe of the ſaid ſociety; which was accordingly "done in an open and public way; and furthermore deſired his majeſty, if he were "not fully ſatisfied in the caſe, that he would adviſe and conſider of the pretenſions of all parties before his council. Whereupon his majeſty, after a week's "conſideration thereof, was graciouſly pleaſed to ſign the grant, of which I have "herewith ſent your grace a copy, until the original can be tranſmitted.

"And as the ſociety has ſo far taſted of his majeſty's juſtice and favour, they "are very confident, that your grace will not only in all things cauſe the ſame to "be effectually executed to the advantage of the ſociety, but alſo in all other their "concernments continue your favour unto them, ſo as they may encounter no "other difficulties; whereby they may be the better enabled to effect thoſe ends, "for which his majeſty was pleaſed to incorporate them.

"I am, my Lord,

"Your Grace's moſt obedient,

"and humble ſervant,

"BROUNCKER, P. R. S."

Sir William Petty, who was then in Ireland, was deſired to make a calculation of theſe fractions of adventures, *&c.* which he accordingly did, but did not ſend the ſociety the reſult of it, in regard *that intereſt was paſt before by patent unto ſome others*, as he mentioned to Sir Robert Southwell, when the latter deſired him, in the name of ſeveral of the moſt eminent members of the ſociety, to ſend over to them his calculation. Sir William accordingly communicated it to Sir Robert, whoſe letter to Mr. Oldenburg, dated at Dublin May 15, 1663, containing it, is ſtill extant [w].

January 7. Mr. Bruce brought in an account of wind-mills in Holland; which was ordered to be regiſtered [x].

Mr. Bruce was deſired to procure from his friend in Holland a more particular deſcription of theſe mills and their fabric.

Mr. Pell took theſe papers of Mr. Bruce with him, and promiſed to add to them his own obſervations concerning mills.

Sir Robert Moray's paper about the way of making malt in Scotland was read, and ordered to be regiſtered [y]. It was as follows:

"Malt is there made of none other kind of grain but barley, whereof there are "two kinds; the one having four rows of grains in the ear, the other two. The "firſt is the more commonly uſed, but the other makes the beſt malt.

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[w] In a collection of letters given by Henry Miles, D. D. F. R. S. to the Royal Society. [x] Original Regiſter, vol. ii. p. 93. [y] Ibid. p. 95.

“ The more recently that barley has been thraſht, it will make the better malt. If it hath been thraſht ſix weeks or upwards, it will not prove good malt, unleſs it be kept in an equal temper, whereof it readily fails, eſpecially if it be kept up againſt a wall: for that, which lies in the middle of the heap, is freſheſt; that, which lies on the outſide and at the top, is overdried; that, which is next the wall, ſhoots forth; and that, which is at the bottom, rots. So that when it comes to be made into malt, that which is ſpoiled does not come well (as they call it) that is, gets never that right mellow temper malt ought to have, and ſo ſpoils all the reſt: for ſome grains come well, ſome not at all, ſome half, and ſome too much.

“ The beſt way to preſerve thraſht barley long in good temper, is not to ſeparate its chaff from it. But as long as it is unthraſht, it is always good. Brewers uſe to keep their barley in large rooms on boarded floors, laid about a foot in depth, and to turn it over now and then with ſcoops, to preſerve it from ſpoiling.

“ Barley, that hath been overheated in the ſtacks or barn, before it be ſeparated from the ſtraw, will never prove good for malt, nor any other uſe: but though it heat a little after it is thraſht, and kept in the chaff, it will rather be the better for it than the worſe, for then it will come the ſooner, and more equally.

“ A mixture of barley, that grew in ſeveral grounds, proves never good malt, becauſe it comes not equally.

“ The beſt barley therefore to make malt of is that, which grows in one field, and is kept and thraſht together.

“ Take then good barley, newly thraſht, and well purged from the chaff, and put eight bolls, that is ſome ſix Engliſh quarters of it at leaſt, in a trough of ſtone, where let it infuſe till the water be of a bright rediſh colour; which will be about three days, more or leſs, according to the moiſtneſs or dryneſs, ſmallneſs or bigneſs of the grain, ſeaſon of the year, or temper of the weather. In ſummer malt does not make well at all: in winter it will need longer infuſion than in the ſpring or autumn; and in froſty weather, longer than after a thaw. You may know when it is ſteept enough, by other ways and marks beſides the colour of the water; as by the exceſſive ſwelling of the grain or too much ſoftneſs when one cruſhes it, if it be over ſteept; which otherwiſe, when it is in the right temper, will be like that barley, which is prepared to make broth of, or that kind of barley called by ſome *orge mondé*.

“ When the barley is ſufficiently ſteept, take it out of the trough, and lay it on heaps to let the water drain from it. Then after two or three hours turn it over with a ſcoop, and lay it in a new heap ſome twenty or twenty-four inches deep: this they call the coming heap; and in the managing of this heap aright, lies the greateſt ſkill. In this heap it will lie forty-eight hours more or leſs, according

ing to the forementioned qualities of the grain, before it come to the right temper of malt: which that it may all do equally, is moſt to be deſired.

“ While it lies in this heap, it is to be carefully lookt to after the firſt fifteen or ſixteen hours; for about that time the grains will begin to put forth at the end, that taketh root, which when they have equally and fully done, the malt muſt within an hour after be turned over with a ſcoop; otherwiſe the grains will begin to put forth at the other end too, which by all means muſt be prevented; elſe the malt will be ſo ſpoiled, that no art will make good ale of it, neither as to pleaſantneſs of taſte nor ſtrength.

“ But if all the malt comes not equally, becauſe that, which lies in the middle, being warmeſt will come firſt, turn it over ſo as the outmoſt may be laid inmoſt, and ſo let it lie till all become alike.

“ As ſoon as you find the malt ſufficiently come, turn it over, and ſpread it to a depth not exceeding five or ſix inches; and by that time it is all ſpread out, begin and turn it over and over again three or four times; afterwards turn it over in like manner once in four or five hours, making the heap thicker by degrees, and continuing ſo to do conſtantly for the ſpace of forty-eight hours at leaſt. This turning of it over frequently, cools, dries, and deads the grain; ſo that it becomes mellow, melts eaſily when it is brewed, and ſeparates entirely then from the huſks.

“ Then throw up the malt into a heap as high as you can, where let it lie till it grow as hot as your hand can endure it; which uſually comes to paſs in ſome thirty hours ſpace. This gives the malt that ſweetneſs, that it ought to have, and contributes to perfect the mellowneſs thereof.

“ After the malt is ſufficiently heated, throw it out and ſcatter it ſo as to cool it, and turn it over again ſome ſix or eight hours after, and then try it upon the kiln to dry; where after one fire, which muſt ſerve for twenty-four hours, give it another flower, and a third, if need be. For if the malt be not thoroughly dried, it cannot be well ground, it will not diſſolve well in the brewing, and the ale it makes will be red, bitter, and will not keep.

“ The beſt fewel is peat, the next charcoal made of pit-coal, or cinders, then heath: broom and furzes are naught. And if there be not enough of one kind, burn the beſt firſt, for that gives the ſtrongeſt impreſſion as to the taſte.”

Upon reading this paper ſeveral ways were mentioned of drying malt, *viz.* with ſtraw, by the ſun, *&c.* It was alſo ſuggeſted, that ſince in the Weſt-Indies they brew beer out of bread made of maiz, a like trial might be made with barley, as alſo with maiz; and Mr. WINTHROP was deſired to be curator of this experiment, as ſoon as he could be provided with this material.

The lord viſcount Brouncker was reminded of making the experiment of proportioning bodies of different matter and bulk, to fall in the ſame time; Monſ. Huygens affirming, that a ball of cork may be ſo big, as to fall with equal ſwiftneſs through the air as a ball of iron.

Dr. Wilkins mentioned the proſecution of the experiments of compreſſing water; and it was objected, that nothing could be concluded from thoſe experiments with reſpect to what was intended by them, ſince the veſſels, wherein they are made, will retch.

James lord Annesly was propoſed as a candidate by Sir James Shaen, and immediately elected by ballot, his lordſhip waving to come in by the privilege of his birth.

Mr. Aubrey and Mr. Neile were elected.

Mr. Hooke made two of the experiments propoſed by him at the preceding meeting, *viz.* that of the difference of the weight of warm and cold water; and that of the difference of refraction in warm and cold water: which latter he was deſired to repeat at the next meeting, when he was alſo to make the experiment of the living of inſects in condenſed air; and to bring in an account of all in writing.

He gave in his account of ſome trials for finding how much the preſſure of water is increaſed by the deſcent of heavier, or the aſcent of lighter bodies therein: the reading of which was deferred till the next meeting.

He was directed to ſhew the ſociety the way of making, with a lamp, coloured glaſs out of white glaſs.

A letter was read, written by Mr. Beal to Mr. Oldenburg, dated Dec. 21, 1662 [a], containing an overture of propagating cider-fruit all over England by the influence of the ſociety. Whereupon a committee was appointed to conſider of this matter, and to meet for that purpoſe at Mr. Charles Howard's lodgings at Arundel-houſe, on the Monday following, at ten in the morning; and to make a report to the ſociety. The perſons nominated of this committee were, Mr. Howard, Mr. Boyle, Mr. Brereton, Sir Robert Moray, Mr. Henshaw, Mr. Evelyn, Mr. Balle, Col. Tuke, Dr. Whistler, Dr. Goddard, Dr. Merret, and Mr. Oldenburg; of whom any three were to be a quorum.

It was ordered, that Mr. Beal ſhould be thanked by Mr. Oldenburg for his reſpect to the ſociety, and acquainted, how acceptable his propoſition was to them, and what they had begun to do in order to the promoting of his deſign; as alſo, that they had declared him, from that time, an honorary member of the ſociety, and would receive him, upon his deſire, a fellow of it.

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[a] Supplement to the Letter-books, vol. 1. p. 165.

Mr. Hooke propoſed two experiments for the next meeting, *viz.* 1. Of the force of deſcending bodies from different heights: 2. Of compreſſing air by quickſilver.

He deſired again, that thoſe members, who were acquainted with the ways of ordering fewel to the beſt advantage, might bring in an account thereof, in order, that, upon conſideration of what had been done hitherto in that matter, it might be farther conſidered how to improve it. Whereupon, ſeveral members ſuggeſted what came into their minds.

Mr. Howard mentioned a way of roaſting in a very ſhort time, with baſting the meat with flames of lard poured upon it: Dr. Wilkins that of boiling and ſtewing meat with lamps: Mr. Hoskyns, that of roaſting many pieces of meat with a fiery globe of plated iron ſtanding in the middle: Sir Cyrill Wyche, that of keeping water and other things warm in a double pot, ſeparated by an interſtice: Sir Robert Moray and Dr. Goddard, that of brewing beer in a kettle, having only a braſs bottom, and in the middle thereof a globe of braſs, open at the lower end, into which the fire goes, whereby the braſs of the reſt of the kettle is ſaved: And Mr. Balle, that of boiling water in a hogſhead, by a copper globe, without a neck, put in a furnace heated with ſea-coal.

Dr. Goddard promiſed to bring the account of the adheſion of the finger to the tube in the mercurial experiment.

Mr. Schroter's paper, on the way of increaſing of ſalt-petre in great quantities, was read, and ordered to be regiſtered[y], as follows:

“ Firſt, there muſt be made an arch about four foot high, as wide as you like it, and the thickneſs of the wall on the top about two ſtones thick.

2. “ The lime of that wall muſt be made of theſe ingredients, *viz.* take three parts of lime, being quenched with rain-water that falls with the north wind; three parts of ſheeps dung, and one part of ſheeps urine; then mingle theſe things well together, and ſtrew coarſe ſalt upon, and temper it thoroughly with ſalt.

3. “ The top of that arch muſt be covered with the beſt ſalt-petre earth, and that muſt be watered with ſuch rain-water as afore-mentioned, mingled with ſheeps urine, or ſaltpetre lee: and this muſt be done every fourteenth night, *viz.* after the moon is new.

1. “ You may make a garden upon it, and, *pro formâ*, plant upon it what you pleaſe.

2. The field-ſtones ſerve for that purpoſe better than bricks, becauſe of their narrow jointing.

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[y] Original Regiſter, vol. ii. p 98.

3. “ To gather ſheep's urine is eaſy to be done, when the ſtable is boarded, and hanging downward.

January 14. The lord ANNESLEY and Mr. NEILE were admitted.

Dr. GODDARD's account of the experiment of the tube and quickſilver was read, and ordered to be regiſtered [b], as follows:

“ A tube of glaſs, of ſo wide a bore as might conveniently be ſtopped with the finger's end, and about three foot in length, was let down erect into a veſſel of quickſilver of ſufficient depth to float it in that poſture, and ſo ſupported from inclining to any ſide, as left withal at liberty to perpendicular deſcent: then a mark was affixed at the lower extremity of the part borne above the ſurface of the quickſilver: after being taken up, and the end that had been immerſed being cloſe ſtopped with the finger, it was filled with quickſilver, and then the upper end being alſo cloſe ſtopped with the finger or thumb of the other hand, being carried erect, the former end was immerſed under the ſurface of the quickſilver, and the finger ſtopping it taken away; and ſo the tube being kept cloſe ſtopped at the upper end, was warily let down to the bottom of the veſſel containing the quickſilver. After all, the tube did ſtick ſo faſt to the finger or thumb ſtopping the upper end, as to be lifted thereby ſome inches above the mark of its immerſion, and ſometimes it was lifted quite out of the quickſilver in the veſſel.

“ And whereas it was ſuggeſted, that a tube of a leſſer bore than thoſe, with which the experiments were made, ſo ordered, would riſe preciſely to the mark of the immerſion (the former being raiſed higher, by the advantage of the pulp of the finger forced farther into the upper end) it was found indeed much more difficult to raiſe it at all (the ſkin and grain of the finger not ſo cloſely complying and touching in all parts, when applied to a ſmaller bore) and tho' ſticking firmly at the firſt raiſing, yet it would fall off before it could be raiſed to the mark of immerſion before mentioned.

Mr. HOOKE's two papers were read, the one containing an account of ſome trials for finding how much the preſſure of the water is increaſed by the deſcent of heavier, or the aſcent of lighter bodies therein; the other, containing an experiment concerning the different weight of cold and warm water: both which papers were ordered to be regiſtered [c]. The latter was as follows:

“ A ſmall bolt-head of glaſs being, by water put into the hollow of it, ſo poiſed, that it was but a little lighter than water, was afterwards, at the ſmall end, ſealed up hermetically. Then being put into a glaſs of cold pump water, it remained ſuſpended at the top of the water; and being thruſt down to the bot-

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[b] Original Regiſter. vol. ii. p. 225.

[c] The former is regiſtered, p. 99. and printed in Dr. HOOKE's Philoſoph. Experiments and Obſervations, p. 14—18. and the latter is regiſtered, p. 103.

"tom, it would of itſelf quickly aſcend again to the top, and there remain. This "glaſs of water being ſet by the fire, whereby the water began to be warm, the "ball, within the ſpace of a minute, began to deſcend, and ſo continued, till it "came to the middle of the glaſs; where (the glaſs being at that time removed "from the fire, and placed upon a table in the room) it remained ſuſpended. So "that if it were by a ſtick depreſſed below, or raiſed above, that middle place "of the glaſs, it would, being let alone, return to it again, till the water again "growing colder, it began to re-aſcend to the top of the water, the place from "whence it at firſt deſcended.

"The reaſons of which phænomena ſeem to be theſe; that the parts of water "are, by the action of heat, diſſipated, and put into a more looſe and rarefied "conſtitution: ſo that the ſame parts in this conſtitution, filling a greater ſpace "than they did when leſs acted on by heat, make up, by conſequence, a lighter "body, and ſo are not able to bear up the ball of glaſs, as they were before "that expanſion.

"That thoſe parts of water, which are heated by the fire, being rarefied, and "conſequently made lighter than the others that are not ſo much heated, are by "the colder, and conſequently heavier parts of the water, thruſt up to the top; "ſo that the lighter and hotter being always protruded to the top by the heavier "and deſcending cold ones, which keep near the bottom; theſe are too heavy "to let the ball ſink into them, and the upper too light to bear it up; whence the "ball remains ſuſpended in the middle, till by degrees the heat in the water decaying, "the rarefied parts of the water relapſe to the cloſer and heavier texture, "and ſo bear up the ball to the top of the water.

"The uſes of this experiment may be ſome ſuch as theſe:

"Firſt for profit: This might have hinted to a conſiderate man ſuch an invention, "as is publiſhed by GLAUBER, of making a bath or ſtove in a wooden "veſſel, by the help of ſome ſmall copper (or other metalline) retort, or ſuch-like "body, which will endure the fire. For ſince that body is kept in a great heat, "and the neck of it is inſerted in the bottom of the tub; it is clear, that as faſt "as the water is heated in it, it muſt be driven out of it, and carried to the top "of the water in the tub, by the colder parts of the water, which thruſt themſelves "into its place; whence there ariſing a continual circulation of the hotter "and colder parts of the water, the fire being continued about the metalline retort "or body, will quickly heat all the parts of the water in the tub, to almoſt the "ſame degree with that in the retort. This contrivance, if proſecuted, might "perhaps be very beneficial to brewers, dyers, and ſuch other trades, as have occaſion "to make uſe of great quantities of water heated; as was lately intimated "by Dr. GODDARD.

"Next for pleaſure and curioſity: This may afford us ſome hints; as firſt, of "a way of making a weather-glaſs, whereby the heat and cold of the ſeaſons of "the year may be very pleaſantly exhibited by the aſcending and deſcending of

“ ſeveral bodies, differently poiſed and ſhaped into the forms of various animals,
“ as men, birds, beaſts, fiſhes, reptiles, or the like. And ſecondly, it may af-
“ ford us a hint of making perhaps a natural perpetual motion; for ſuppoſing
“ there was a round hollow ring, or ſome kind of glaſs pipe, ſo bent, that it
“ might return into itſelf (like the Egyptian hieroglyphic of the year) that had
“ a paſſage clear round it, ſo as that a liquor might circulate, without being
“ waſted or leaked out; there might be cauſed a perpetual circulating motion of
“ a liquor, that ſhould almoſt fill that pipe; if by any means it can be contrived
“ to keep one ſide of that pipe hotter than the other; which would be quickly
“ done, if there can be in nature found two liquors or bodies, whereof the one
“ is ever hotter than the other: for in that ſide of the pipe, which is incloſed by
“ the hotter medium, the liquor will be ever aſcending; and in the oppoſite, al-
“ ways deſcending. This will hold in moſt liquors, and moſt conſpicuouſly in
“ air; of which I ſhall have occaſion to ſay more on another ſubject. Thirdly,
“ it hints a way of poiſing a body in the midſt of a veſſel of water; which may
“ likewiſe be done, by impregnating water with ſalt; for the ſalteſt and heavieſt
“ part of water will ſubſide and remain at the bottom, and that water, which ſwims
“ at the top, will be much lighter and freſher.

“ A third uſe of this experiment may be for caution: For it may hint a thing
“ perhaps worth inquiry, Whether ſhips, that paſs from the northern or polar
“ ſeas, to thoſe that lie near the torrid zone, will endure to be loaden ſo deep,
“ as they may for a contrary voyage; ſince the waters there being hotter, and
“ conſequently more rarefied, are not able to bear ſo great a loading, if this
“ lightneſs of the water be not counterpoiſed with the greater abundance of ſalt,
“ which the hotter water may be impregnated with.

“ A fourth uſe of it may be for conjecture: For, to ſpeak hypothetically, it
“ may be ſuppoſed, that the vaſt ſpace of the vortex of the ſun or the heavens,
“ wherein the ſun, earth, and planets are contained and moved, may be filled
“ with a fluid body, whoſe parts are of different denſities, according as they are
“ nearer or farther from the great fire of the world, the ſun, which may be placed
“ in or near the center of that ſpace, according to the Copernican hypotheſis.
“ Next it may be ſuppoſed, that the ſeveral bodies of the planets and earth may
“ be hollow like ſo many glaſs bubbles; and though they appear much more
“ maſſy than the ambient æther, they may, perhaps, as to their whole bulk, be
“ in an *æquipondium* to the ambient fluid. And ſo, according as they are more or
“ leſs maſſy, they may take their ſeveral ſtations in the fluid æther. Some, ſuch
“ as ☿, ♀, being lighter, may be in an *æquipondium* with the æther near the ſun;
“ others, whoſe cruſts may be thicker, and ſo more maſſy, as ♄, ♃, *&c.* may be
“ in an *æquipondium* with the æther farther diſtant from the ſun. And, had I
“ time, I think there is no affection of the planets, but might be illuſtrated by
“ circumſtances of this experiment.”

The committee appointed at the laſt meeting for the conſidering of Mr. Beal’s propoſition for the propagating of cider-fruit made a report, that they had met according to order, and conſidered the ſaid propoſition, and agreed, 1ſt, That this buſineſs ſhould be recommended to all the members of the ſociety, that as many of them, as had conveniency, might fall upon the work themſelves; and that thoſe, who had none, might endeavour to perſuade their friends in the country, who had ſuch conveniency, to promote this work. 2dly, That Mr. BEAL ſhould be deſired to ſend up graffs and ſeeds, and directions for ordering them; as alſo to publiſh ſome paper, which might excite perſons to the work; and to acquaint the ſociety what experience he had of the drawing of aquavitæ in good quantity out of cherries, plums, elder-berries, *&c.*

Mr. HOWARD, Mr. BRERETON, Col. TUKE, Dr. WILKINS, Dr. HOLDER, Mr. EVELYN, Mr. HENSHAW, Mr. HOSKYNS, *&c.* engaged to take off ſome of the graffs to be ſent up, and to convey them to their friends for propagation.

Mr. HOOKE made the experiment of condenſing air by the preſſure of water; but the trial not agreeing with the hypotheſis, it was ordered to be repeated at the next meeting.

He made an experiment of the force of falling bodies to raiſe a weight; but was ordered to try it by himſelf, and then to ſhew it again in public.

Dr. MERRET ſuggeſted an experiment of keeping two weather-glaſſes, one in a cellar, the other abroad, to ſee whether it be colder in cellars in winter than in ſummer. He was deſired to make the trial, Mr. HOOKE furniſhing him with weather-glaſſes.

Dr. MERRET mentioned an experiment of ZUCCHIUS, proving, that there is really an unequal temper in cellars, with reſpect to heat and cold, in ſummer and winter.

Sir ROBERT MORAY and Mr. HOSKYNS related the way of making the burning balls at Liege, *&c.* which is a thrifty kind of fewel, laſting long, and burning without ſmoke, and leaving no aſhes.

Sir PAUL NEILE ſuggeſted, that the practice of this thriftineſs would prove prejudicial to ſhipping.

Mr. HOOKE was ordered to conſider of the ſeveral ways of ordering fewel, that had been ſuggeſted, in order to make an improvement thereof.

Sir ROBERT MORAY communicated an account of the perſons killed with ſubterraneous damps; which was ordered to be regiſtered[a], and was as follows:

" In a coal-pit belonging to the lord SINCLAIR in Scotland, where the coal is " ſome eighteen or twenty foot thick, and antiently waſted to a great depth, the " colliers about ſome three weeks ago, having wrought as deep as they could, and

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[a] Original Regiſter, vol. ii. p. 107.

“ ing to remove into new rooms (as they call them) did, by taking from the pillars, which ſupport the roof and earth over it, ſo much weaken them, that within a ſhort ſpace after they were gone out of the pit, the pillars falling, the earth above them filled up the whole ſpace, where the colliers had lately wrought, with its ruins. The colliers being hereby out of work, ſome of them adventured to work ſo near the old waſtes, that ſtriking through that ſlender partition of the coal-wall, that ſeparated between them and the place where they uſed to work, they quickly perceived their error; and fearing to be ſtifled by the bad air, that they knew poſſeſſed theſe old waſtes, in regard not only of the damps, which ſuch waſtes do uſually afford, but alſo there having for many years been a fire in theſe waſtes, that filled them with ſtifling vapours, retired immediately, and ſaved themſeves from the eruptions of the damp. But next day, ſome ſeven or eight of them came no ſooner ſo far down the ſtairs, that led them to the place, where they had been the day before, as they then intended, but upon their ſtepping into the place, where the air was infected, they fell down dead as if they had been ſhot. And there being amongſt them one, whoſe wife was informed he was ſtifled in that place, ſhe went down ſo far without inconvenience, that ſeeing her huſband near her, ſhe ventured to go to him; but being choaked by the damp as ſoon as ſhe came near him, ſhe fell down dead by him.

“ This ſtory I had from the earl of Weymes, brother-in-law to the lord Sinclair, as it was written to him from Scotland.”

Mr. Vermuyden mentioned a method uſed for the reviving of men ſuffocated in the coal-mines, by putting their heads into freſh earth; and was deſired to give the account thereof in writing; as alſo of his other obſervations made concerning coal-mines, and the accidents therein.

Mr. Winthrop obſerved, that a ſhip built in New England was lately arrived here; and he was deſired to bring in an account of the ſhape and ſize of it.

He was likewiſe reminded of the Indian bread and malt.

Mr. Vermuyden and Mr. Stanhope mentioned, that the Greenland men do not load their ſhips ſo deep in the Greenland ſeas as they might, becauſe they were apprehenſive of ſinking, when they ſhould come more ſouthward. It was queried, whether they did this upon the account of thinner and lighter water, or from fear of foul weather.

Mr. Stanhope, Mr. Hoskyns, and Mr. Hooke[*] were deſired to draw up ſome inquiries concerning the ſaid particular of loading ſhips in Greenland, in order to be ſent with the fleet going thither.

The lord viſcount Brouncker was put in mind of his experiment concerning the meaſure of the firſt velocity of bodies.

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[*] Mr. Hooke's inquiries for Greenland are printed in his *Philoſophical experiments and obſervations*, p. 18, 19.

Mr Hooke propoſed to bring in at the next meeting the following experiments: 1. Of the living of inſects in condenſed air. 2. Of the force of falling bodies. 3. Of reſpiration. 4. Of the different refractions in cold and warm water.

January 21. Mr. Aubrey was admitted.

Mr. Beal's letter to the preſident was read; in which he acknowledged the favour of the ſociety in receiving him as an honorary member, and engaged his zeal and activity for their ſervice. Whereupon he was elected a fellow of the ſociety, at his farther deſire.

An order was made for demanding the arrears of the weekly payments, and for advancing the remainder of the preſent quarter.

Mr. Evelyn was deſired to read over and digeſt Mr. Beal's papers lately ſent to Mr. Oldenburg concerning the propagation of cider, together with directions and encouragement for the ſame, in order to their being printed.

Mr. Hoskyns was deſired to engage in the ſame work with the lord viſcount Scudamore and his own father, Mr. Beal having particularly recommended theſe two perſons for it.

The lord viſcount Brouncker, Dr. Wilkins, and Dr. Holder promiſed to engage their friends in this buſineſs of cider.

Mr. Hooke made an experiment of condenſing air by water; of which he was ordered to bring in an account in writing at the next meeting.

The preſident ſuggeſted, that it was to be conſidered in this experiment, whether the compreſſion of air was made by the weight of the water only? or whether the coldneſs thereof did contribute to it?

His lordſhip propoſed likewiſe, that it might be tried, whether the compreſſion in the ſame experiment holds exactly by 20, 40, 60, 80, or not?

Mr. Hooke ſhewed the ſcheme of an inſtrument for making the experiment of the force of falling bodies; which was ordered to be made againſt the next meeting.

He made a trial with a bladder, how long the ſame air would ſerve for reſpiration without the ſupply of freſh air; and he found, that it ſerved for five inſpirations, though with difficulty. He was ordered to try it again, but with a glaſs; and to bring in the account thereof in writing.

Dr. Merret acquainted the ſociety, that he had received an information from Naples, concerning a perſon, who had an art of keeping new-born infants alive, without reſpiration, for a good while. It was thought very deſireable to have a farther inquiry made into this matter, both as to the truth of the fact, and the way of performing it, *viz.* whether it was done by hindering the cloſure of the *foramen ovale*, which is ſuppoſed to be ſhut ſoon after the birth of the animal.

Dr. Merret mentioned ſeveral inſtances of divers living a good while under water without reſpiration; and he was deſired to bring an account of them in writing.

Mr. Boyle obſerved, that he had kept a viper alive under water for five hours; and moved, that the lungs of amphibious animals, and particularly of frogs and tortoiſes, might be carefully diſſected, and the ſtructure thereof well obſerved.

He took notice, that ſwallows live under frozen water in the Baltic ſea.

Dr. Croune ſuggeſted an experiment of keeping a new-caſt puppy in warm milk, to ſee how long it would live ſo without air. He was deſired to be curator of this experiment, and to remember the experiment, with which he had been formerly charged, of making a carp live for a good while in the air.

Mr. Hooke's inquiries for Iceland were read, and ordered to be regiſtered[f], and recommended by Col. Tuke to the Daniſh lord, who was lately ambaſſador in England, and gave the ſociety a viſit.

Dr. Croune moved, that ſome Engliſh water might be ſent to the Eaſt-Indies, to try, whether, at its return, it would yield an inflammable ſpirit. It was orderdered, that a copy of the inquiries for the Eaſt-India voyages ſhould be given to him; and that this experiment ſuggeſted by him be added to them.

Mr. Pell was deſired to peruſe the ſame inquiries, and to conſider, what obſervable things might be added to them.

Mr. Graunt read Sir William Petty's letter, giving a farther account of Sir William's new ſhip; and Mr. Graunt was deſired to give an extract of it.

Mr. Hooke propoſed an experiment againſt the next meeting of ſhutting up an animal and a candle together in a veſſel, to ſee whether they would die at the ſame time or not.

January 28. Mr. Hooke made the experiment of ſhutting up in an oblong glaſs a burning lamp and a chick; and the lamp went out within two minutes, the chick remaining alive, and lively enough.

He brought in an account of ſome trials for finding the preſſure of the parts of water upon one another, and the elaſtic power of the air: which was read, and ordered to be regiſtered[g], as follows:

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[f] Original Regiſter, vol. ii. p. 108. Theſe inquiries are printed with ſome variation in Dr. Hooke's *Philoſ. experiments and obſervations*, p. 19—22.

[g] Regiſter, p. 112.

" For the making theſe experiments, there was prepared a long glaſs tube, ſeal-" ed at one end; which being erected perpendicularly, with the ſealed end down-" ward, was filled with water, and ſo faſtned againſt a wall. Then there was " taken another tube of glaſs, which was twelve inches long in the cavity of it; " and was ſealed at one end, was divided into inches and half inches, was ſmall " enough to paſs to and fro in the cavity of the former tube, and was very equally " and evenly drawn. Then to the open end of this was tied a ſmall long plum-" met, heavy enough to ſink this pipe to the bottom of the longer tube. And to " the other end of this ſmall tube was tied a ſtring, by which it was let down or " drawn up, as there was occaſion. Theſe things being in a readineſs, the pipe " being held by the ſtring (and not touched with the hand, becauſe of rareſying " the air) was let down gently into the water; and as it deſcended, the water in " the ſmall pipe began to ariſe, and ſo increaſed the lower it deſcended. The " degrees, by which it got into the ſmall tube, according to the ſeveral depths it " deſcended to under the water, at Greſham College, were theſe: The water roſe " half an inch, that is, the 24 half inches of water were contracted to 23 half inches " of ſpace, when the under-ſurface of that air was below the ſurface of the water " 20 inches; to 22 when 37 inches under, to 21 when 58, to 20 when 79; which " being a fifth part of a cylinder of water, able to counterbalance the preſſure of " the air, the whole cylinder may hypothetically be concluded to be near 395 inches, " that is about 33 foot.

" I did, ſince that, erect a tube, ſome thirteen foot long, and fitting all things " as in the former experiment, I collected this table A, whoſe firſt " row of numbers ſhews the equal ſpaces, into which the air was " extended, and the laſt ſhews the height of the water above the " under ſurface of the air. Since that, in the ſame tube, ſtanding " in the ſame place, I reiterated the experiment, and collected this " following table B; which three obſervations being ſo different one " from another, may ſeem to overthrow each other, and the cer-" tainty of this kind of experiment in general. But as I cannot vin-" dicate the trial from being guilty of ſome errors, it being almoſt " impoſſible to make theſe trials ſo accurate, but that there will be " ſome miſtake committed (for the error of a hair's breadth in the " ſmaller pipe may make an error of ſome inches in the longer); " as I ſay I cannot vindicate them, ſo neither do I believe, that " theſe ſeeming contrarieties do wholly proceed from the unaccu-" rateneſs in the proceſs: for ſince the common air is ſometimes " under a greater, ſometimes a leſs degree of preſſure, the degrees " of force requiſite to promote the condenſation further muſt ne-" ceſſarily be differing.

48	00	A
47	08½	
46	17	
45	27	
44	36	
43	45½	
42	58	
41	68¼	
40	80	
39	91½	
38	105¼	
37	117	
36	130½	

24	00	B
23	13	
22	31	
21	52	
20	76	
19	101	
18	127	
17½	142	

" Hence by the firſt experiment I judge the hight of the cylin-" der of water able to counterbalance the preſſure of the air at that " time to be near 395 inches, that is about 33 foot. By the ſecond, " I judge the counterbalancing pillar then to be between 390 and " 400 inches, or near about 33 foot. By the laſt, I gueſs it to be " about 32 foot.

" This experiment therefore, if accurately made at ſeveral ſeaſons and times of " the year, may afford us a very eaſy way of knowing the preſſure of the air for " that time. And this more accurately and nicely, than can be performed with y " the ordinary way. For whereas the ſhortning and increaſe of the mercurial cy- " linder is at moſt not above two or three inches, in this experiment the aqueous " cylinder will change fourteen times as much.

" Next, this experiment may help us to gueſs at the preſſure of the ſea-water " againſt air let down to the bottom of it in a diving-engine, by knowing the " proportion between the gravity of ſalt and freſh-water, and the depth, to which " the engine is let down: but yet it were very deſireable, that ſuch, as have the op- " portunity of making trials at ſea, would be diligent in it. For though there " ſeems to be no doubt, but that the water there does proportionally preſs accord- " ing to its perpendicular height, yet it is not eaſy to predict, how much it may " vary from this hypotheſis; which deviation may be cauſed, either by the ex- " treme cold at the bottom of the ſea, which may weaken the ſpring of the air; or " from the differing gravity of the upper and lower parts of the ſalt-water; or " from ſomewhat elſe, whereof we may be yet ignorant.

" For the more accurate making of theſe trials, I think it were requiſite to have " ſome ſuch engine as this: Take a good ſtrong glaſs bottle, that will hold about " a gallon, and let there be fitted to it a handſome ſcrew-cover of braſs, which may " ſcrew very cloſe and tight, that it will not leak water. In the top of this cover " let there be made a ſmall hole with a needle-drill, whereby the water may get in, " or air get out, as occaſion ſhall require: or, inſtead of this hole, let there be made " a little pipe like that in the figure, whoſe end may be ſo turned, as that the hole " of it may be open downward. Then hanging a good weight under it, let it " ſink with the cover upward, to determinate depths, where ſuffer it to ſtay for a " little ſpace, that the water may be intruded in, as much as the air will ſuffer it: " then drawing up the bottle, and weighing the water it brings up, and repeating " the experiments at ſeveral depths, it will be eaſy to give a true account of the " preſſure of the water at the bottom, without going thither.

There may be many other ways of making this kind of experiment, but this is " the moſt cheap, eaſy and certain of any I know; nor is there any danger of " breaking the bottle either inward or outward. For as the bottle deſcends, the " water ruſheth in, and as it is drawn up, the air gets out."

Mention being made in this paper of a diving-glaſs ſerving to give a true account of the preſſure of water at the bottom of the ſea againſt the air, Mr. Hooke was ordered to try it in Dr. Goddard's long wooden tube.

Mr. Hooke was ordered likewiſe to procure a glaſs to be made, that might ſerve inſtead of a bladder, to make the experiment of reſpiration, *viz.* how long the ſame air would ſerve to breath in, without any ſupply of freſh air.

He was alſo directed to try, how long fiſhes will live in the open air, and in a glaſs full, and exhauſted of air.

Dr. CHARLETON remarked, that fiſhes die by hindering the motion of their gills, by gagging or hooking them, *&c.* He was deſired to ſhew this by experiment.

Dr. MERRET ſuggeſted, that the gills of fiſhes are to them a ſupplement to, and do the office of lungs; and added, that the aorta divaricates itſelf into the gills; and that the water being taken in by fiſhes at the mouth, is carried out again ſlimy by the gills. He was deſired to demonſtrate the circulation of the blood in fiſhes by ſome anatomy of a fiſh.

Mr. MATTHEW WREN gave an account of a carp kept a whole week in a cellar out of the water, and fed with moiſtened bread, wetting the gills of it once or twice a day.

Dr. CROUNE was put in mind to make this experiment, as he had formerly promiſed.

Dr. CHARLETON brought in again his *Myſtery of the vintners: or, a diſcourſe concerning the ſeveral ſickneſſes of wines, and their reſpective remedies now commonly uſed:* which was ordered to be regiſtered [h].

Mr. MATTHEW WREN mentioned, that there was an opportunity of ſending the directions for ſeamen, and the inquiries for the Eaſt-Indies; of both which papers the amanuenſis was ordered to make a copy againſt the next meeting. And Mr. WREN was deſired to have conſtantly a copy ready by him, to ſerve upon occaſion.

Mr. HENSHAW offered himſelf to recommend the inquiries for Iceland to a proper perſon; upon which he had a copy of them delivered unto him.

Another copy was ordered to be given to Col. TUKE, to be recommended by him to the lord ULEFELD, who had lately been ambaſſador from the court of Denmark in England.

The report of the committee appointed November 26, 1662, to examine and give in an account of the matter of fact concerning the ſtructure and ſailing of Sir WILLIAM PETTY's new ſhip, was read, and regiſtered [i], as follows:

“ MY LORD,

“ In obedience to an order of the Royal Society, dated the 28th of November
“ laſt, appointing us to conſider, and report the ſtructure and ſailing of Sir
“ WILLIAM PETTY's double-bottomed ſhip; we have proceeded as followeth,
“ *viz.* The members of the ſociety meeting did, in the firſt place, iſſue an or-

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[h] Original Regiſter, p. 116. It was printed by him at London 1668, in 8vo. under the title of *Two Philoſophical Diſcourſes: the firſt concerning the different wits of men: the ſecond, concerning the Myſtery of Vintners, or a brief diſcourſe,* &c.

[i] Regiſter, p. 134.

" der, that as many ingenious gentlemen, eſpecially ſuch as had been moſt converſant in naval affairs, who were in and near this town, together with the chief " ſhipwrights and ſeamen of this place, ſhould be deſired to meet and confer about " the premiſſes, which accordingly was done; and there was an appearance of the " ſeveral perſons undernamed, *viz.*

" The lord Massareene, " Sir Anthony Morgan, " Dr. Peter Pett, " Mr. Southwall, and " Sir William Petty himſelf	of the ſociety.

" Together with Dr. Wood,
" Mr. Muschamp,
" Mr. Tucker,
" Mr. Amory,
" Mr. Peirson,
" Mr. Taylor,
" Mr. Lancelot,
Capt. Samuel Molyneux,
Capt. Webbe,
Capt. Glover,
Mr. Bathurst,
Mr. Fitzgerrard,
Mr. Osborne,
Mr. William Pett, Maſter ſhipwright.

" At the conference, the ſtructure was firſt conſidered; and that as well by example of the draughts propounded for a double-bodied veſſel of great burthen " and force, as the fabric of that very veſſel, which is already built and uſed by Sir " William Petty.

" Concerning the latter, there are draughts ſent you, namely, of the whole in general, and in particular one of the couples or bindings, by which the two bodies " are connected; upon the ſufficiency whereof the ſtrength of the whole depends, " it being practicable to uſe as many of them as ſhall appear neceſſary; although " there be but two uſed in this preſent fabric, beſides ſome other circumſtantial " croſs beams and ſtrengthnings, which have withal their uſe each of them reſpectively.

" They had before them, beſides the draughts herewith ſent, an exact model of " about 2½ foot long of the ſaid preſent veſſel; whereupon moſt of the company, " and eſpecially the ſeamen, moved ſeveral objections concerning her ſtrength and " otherwiſe; but declaring their judgments, that they ſaw in her the cauſes of " out-ſailing any thing already in uſe; and were well ſatisfied by their own obſervations, of her keeping a good wind, feeling her helm, ſtaying well, round " and quick, without loſing way.

" The chief objections were theſe, which follow:

1. " The danger of divulſion and ſeparation of the two cylinders, by the irruition of the water; for as much as the ſame is received by the two heads, which " ſtand diverging, as in at the wide end of a funnel.

2. " The falling in of the water between the two heads obliquely.

3. " The danger of being over-run, and ſubmerged by a head-ſea, the veſſel " ſailing ſwiftly againſt it; eſpecially when her ſtern is raiſed, and conſequently " the head depreſſed by a wave abaft.

4. " The danger of her platform's being blown up, either by the riſing of the " ſea betwixt the cylinders, or rather by the ſea's coming in by her broad wind-" ward ſide, and cuffing her under the platform; eſpecially when the veſſel either " by her ſail keels, or by the windward-ſea ſeels much.

5. " The danger of waſhing away the men from the platform and deck in a " tumbling ſea, which is often ſo violent as to waſh boats, and ſometimes to carry " away all a ſhip's upper works.

6. " The wrenching the whole veſſel lengthways in a ſhort broken ſea.

7. " The rowling her maſts by the board, which are very great and taunt, " conſidering the ſmallneſs of her holding under water.

8. " The windtaughtneſs of ſo great a deck, and other habiliments, which far " exceed what is requiſite in the veſſels of the ordinary built.

9. " That this veſſel was almoſt laden by her ſaid vaſt deck, maſt, yard, rails, " with proportionable ſails, cables, and anchors, ſo as there remained little ſpace " of ſupport for other goods in order to uſe and ſervice.

" To theſe preceding conjectural objections, being laid down in the nature of " gueſſes, before experiment of what might happen, theſe following anſwers were " after made; which perhaps, without experiment, might be thought conjectural " likewiſe: as namely, to the firſt, he gave theſe two anſwers:

1. " That water between the cylinders would void itſelf, by running away more " quick than that of the open ſea; and by the faſt vent thereof oppreſs but little.

2. " That it paſſes much away underneath and ſideways, beſides endways; ei-" ther of which courſes it would take rather than break a far leſſer ſtrength than " is in this contignation.

" To the ſecond objection he gave anſwers,

1. " As a ſtone falling obliquely upon water would not pierce it (as in childrens " ducks and drakes) ſo water falling obliquely upon ſtronger bodies, as timber, " would do little but reflect off again, according to its incidence without much " wrong.

2. " That as the water thus falling in is ſo much the ſtronger as it falls more per-" pendicularly, ſo it is ſo much the leſs in quantity, none at all falling in perpen-" dicular as is ſuppoſed.

3. “ What force is impreſſed on the further cylinder, by ſuch an oblique ſea, “ on the inſide of its bow, is counterpoiſed by the like parallel impulſe upon the “ outſide of the nearer cylinder.

“ To the third objection he gave anſwers :

1. “ This is prevented by the particular fabric of this veſſel’s head, which is “ univerſally approved ; for it is ſo framed, as that looking directly forward up- “ on it, it ſhews like a cone, whoſe vertex is in the keel. If you look on it ſide- “ ways, it hangs raking, ſo as to make a greater angle with the level of the ſea, “ than the oblique ſide of moſt waves do with the ſame : ſo as there will be an “ angle of void ſpace between the ſtem of this veſſel and the ſide of the wave, “ the which muſt always prevent the evil ; eſpecially ſince the head being ſo ex- “ treme bluff, and floating aloft, doth more eaſily take the way of creeping up “ the ſide of the wave, than of entring into his body.

2. “ The length of the cylinders in ſhort ſeas never ſuffers the ſtem to make ſo “ acute an angle with the level of the ſea as to cauſe this danger ; and in growing “ ſeas, the waves, though very high and great, are not ſo ſteep : ſo as in both “ caſes they think themſelves ſecure.

“ To the fourth objection :

1. “ That the the level of the ſea is 2½ foot from the platform, and the di- “ ſtance of thy cylinders, from inſide to inſide, is 4½ foot : ſo as it is not likely, “ that any wave, whoſe foot is but 4½ foot broad, ſhould riſe up in a cone or priſm “ above 2½ foot high ; in which caſe, the vertex only would touch the platform, “ which is nothing. But the ſea does wrong, as a hammer of ſoft metal with a “ vaſtly big head ; nor doth it its miſchief near ſo much by the velocity of its “ motion, as the bigneſs of its body moved.

2. “ As to the ſea’s coming in her broad windward ſide, and taking the plat- “ form upon a ſeel underneath it ; he anſwered, that the ſea coming in as a wedge “ under the inclined platform doth rather level it, helping up the depreſſed ſide, “ than depreſſing it more.

3. “ The incidence of the ſea upon the place of the platform will be always on “ ſo ſharp an angle, that, like the ſtone in the ducks and drakes, it will rather “ move forward on, than pierce a ſoft body in water, or offend a thin body, as “ boards, well joined and kept down.

“ To the fifth objection he anſwers :

1. “ The cauſe of wrongs of this kind are not by every ſeaman thoroughly “ underſtood ; for, the ſame ſea, that ſhall carry away a huge ſhip’s upper works, “ perhaps ſhould not break a hollow egg-ſhell, or any thin box. Wherefore, to “ underſtand this matter, we muſt take notice, that the ſuperficies of the ſea is “ much more agitated than the ſame deep down. Nay, as water may be boiling-

" hot at the top of a veſſel, and ſtark cold below; ſo the ſea may be in a fret in " its ſuperficies, and yet very quiet ten or twelve foot deep. This being granted, the reaſon is plain, why thoſe great dangers are done to the greateſt ſhips; " namely, becauſe drawing much water, and being difficultly moved ſideways, " they are held faſt by perhaps ten foot of quiet water, which ſix of agitated " cuffs, and tears, and beats them.

" To apply this, he ſaid, that this veſſel drawing but one foot of water, was " all alike in agitated water, and obeyed the whole ſea: neither could any wave, " twice or thrice as high as the keel was deep, take a run upon the ſurface of the " ſea, ſo much faſter than the ſuperficies of the whole ſea, that this whole veſſel " takes up, as to break or diſturb a thing treble above the ſaid ſuperficies or ſurface, more than the keel was below it.

" To the ſixth he anſwered:

" That if the ſeas be ſhorter than his ſhip, he riding upon two of them together, or rather three, with both cylinders, does always ſtand like a three-" legged ſtool upon a very uneven rugged floor.

" To the ſeventh, he anſwered:

" That as the maſts are taunt, ſo the ſhrouds ſpread proportionably, by reaſon " of the great breadth; and when ſhe rowls, ſhe does it more eaſily, becauſe more " ſlowly; as long pendulums make their vibrations in greater times than ſhort " ones do.

" To the eighth, he anſwered:

" Wind-taughtneſs, before the wind and large, does do good and not harm; " and men put to ſea more when the wind is ſo, than bare. It is true, that by " a wind, it will throw a veſſel to leeward; but he having computed, how much " hold in the water is equivalent to any meaſure of wind-taught, can add this " counterpoiſe upon that, when he is in foul weather to claw it off a lee-ſhore, " and be as ſhe was again, when ſhe ſhall go before the wind.

2. " Neither in this veſſel was there any neceſſity of being ſo wind-taught as " indeed ſhe is; nor ſhall it be in any hereafter without ſpecial reaſon.

3. " That ſhe is not leewardly, though wind-taught.

" To the ninth, he anſwered:

" That this veſſel being deſigned for experiments, was deſigned for no other " lading than the ſeveral ſupellex and furniture thereunto: but in the other, it " ſhall be ſhewed, how the double-bodied veſſel ſhall, upon the whole matter, be " more ſerviceable, even for burthen, than any ſingle is or can be.

" But of theſe anſwers Sir WILLIAM PETTY himſelf not being very fond, as he ſeemed not much moved with the objections, he ſtill referred to the experiments, which had been made, not only in ſeveral models, but in about thirty expeditions, which the veſſel itſelf had made; ſometimes in very grown ſeas and foul weather, both within and without the bar of Dublin, in all poſitions of the wind and tides to each other, and in all the degrees of each. Upon which account, he offered, as to the above-mentioned model of his preſent veſſel, not above $2\frac{1}{2}$ foot long, and being no ſtronger in proportion than his veſſel itſelf is, that even the model ſhould live in any water, natural or artificial, which the objectors could find; and itſelf anſwer as many of the aforementioned objections, as did relate unto it. And as for the veſſel, he offered much teſtimony, that in all her ſailings, neither timber or board ever cracked, wound, wreſted, bowed, *&c.* nor pin, or bolt, or nail, ever drawn or ſhortened; that the pitch of no ſeam ever broke, nor ockham ſpewed: ſo free hath it been from wrong of any kind. Nor have the iron braces been added to the cylinders for any neceſſity of ſtrength, but merely to prevent fear in the wives and children of his mariners; and they do more harm than good.

" Having proceeded thus far upon the ſtructure of the preſent veſſel, he proceeded to demonſtrate, that one third part of as much materials, as would build the two bodies, would undoubtedly connect them ſo, as that it ſhall be equally eaſy to wrong either in any part of the ſaid bodies, as to threaten ſeparation. He alſo ſhewed us draughts of ſevetal ways of carpentry, in which he would beſtow the ſaid materials; concluding, that half of what would ſo do it, might competently ſuffice.

" In both which matters he profered ſo well, as that Mr. PETT, the chief ſhipwright, offered to undertake the performance of it. The ſeamen alſo, not ſo well ſatisfied with the preſent ſtructure, did well approve of the whole, as to firmneſs and uſefulneſs; in all which, every perſon preſent at this conference more or leſs acquieſcing, we deſiſt from troubling you farther upon this matter of the ſtructure.

" But before we ſhall enter upon the report of the ſailing, we ſhall ſet down a brief account of ſome concluſions, with the illuſtrations and demonſtrations, whereof Sir WILLIAM entertained the company, *viz.*

" He produced two ſticks of fir wood, of an inch ſquare apiece, and fifteen inches long, coupled together in parallel at three inches diſtance, from inſide to inſide; and ſhewed, that no ſingle body of that material and cubical content could move ſo eaſily end-ways, ſo difficultly ſide-ways, and bear her whole burthen ſo conveniently, that is, ſo diſtant from the center of its magnitude; and, conſequently, whoſe natural ſite, or trim, or ſetting upon the water, was ſo uneaſily changed; that is, in words more peculiar to this matter, which would bear ſo much ſail, nor admit ſo great variety in her lading.

1. " This he did, by comparing the ſame to four bodies equal and ſingle ones, " unto which all others might analogically be referred.

2. " He ſhewed the experiment, that the water between the cylinders did much " help againſt falling to leeward.

3. " The cylinders were as little leewardly, as parallel ſides of equal length and " cubical content.

4. " That a priſm or wedge would go as well with its head as ſharp end fore- " moſt; and that when the boat-men tow a maſt, they tow it by the great end.

" Out of all which he laboured to demonſtrate the qualities of this veſſel *à pri-* " *ori*, in which it excelled the common built.

5. " He compoſed four other double bodies of equal magnitude (though all " alike, yet all rectangular parallelepipedons) and placed at equal diſtance with " each other, and gave in his opinions and conjectures of the commodities and in- " conveniences of each.

6. " He ſhewed the reaſon and ground of the diſtance, at which he placed the " ſeveral bodies of each ſcantling.

" We might here inſert the report, that ſeveral of the gentlemen there preſent " made of this veſſel's ſailing upon ſeveral occaſions; as, that it had out-ſailed ſe- " veral good veſſels half in half, in ſtiff winds and grown ſeas, thwart tides; and " that it ſteered and ſailed extraordinary well. But the company, for the fuller " ſatisfaction both of themſelves and the ROYAL SOCIETY that intruſted them, " cauſed a flag to be made, and have offered it to any; that can win it at a ſailing " to be made for that purpoſe on Twelfth-day, and committed it to the ſeamen " and ſhipwright, to give general notice thereof throughout the harbour; of which " conteſt be pleaſed to take the following account.

" MY LORD,

" We have ſent this relation leſs whole than it might have been, to avail our- " ſelves of the opportunity by Sir MAURICE BERKLEY: however, as to the " truth of all paſſages, we hereunto ſubſcribe.

" Signed by order,

Dublin, Jan. 5,
1662.

" MASSAREENE.

Report of the ſailing of Sir WILLIAM PETTY'*s ſhip, on Twelfth-day.*

" MY LORD,

" We could not think of a better expedient, to call together all ſuch, who were " converſant with boats and the water, than, on a holiday, to propoſe a match;

‘ and to make a free offering (without any danger of loſs on their ſide) of a flag of ſilk, charged with a gilded harp, and in a wreath of laurel above, and in a ſcroll beneath, this inſcription,

PROEMIUM REGALIS SOCIETATIS VELOCIORI:

“ And this to be given to any boat, that ſhould out-ſail Sir WILLIAM PETTY's veſſel, in ſuch a courſe as ſhould be ſet. The prize being publiſhed, and the day come, the only boats, that would adventure for this reward, and for the day, were but three; for all the reſt judged it in vain to conteſt, where thoſe three did appear. And as we do believe them the prime ones, which this place does afford, ſo had they amongſt them the two advantages of fabric; for it lies in the ſhipwright's ſkill, to make a boat do well in her courſe before the wind; or to alter that ſhape, and make her a good ſailor by the wind. But both theſe advantages they cannot, in perfection, unite in any one; the firſt requiring only a ſhallow floating in the water; and the other, for fear of being windward, a good deep rooting in it: yet both theſe advantages Sir WILLIAM affirmed to be in his ſhip.

“ The company then being in great number aſſembled, the mark for goal was agreed on by the parties concerned; which was a ſhip, that rid at anchor, about two miles below the haven. The flag of reward was pitched on a pole at the ſtarting-place, and to be given to the boat, that firſt ſailed round that ſhip, and returned, againſt the wind, back to take it down. It was then tide of flood, and the wind blew very hard, and that in ſudden broken flaws, as they term it.

“ The three boats were, one of them, the king's open barge; another, a large black pleaſure-boat, laden with two tons of ballaſt; and the third, a man of war's boat, belonging to captain DARCY.

“ At the ſign given, all hoiſted ſail, and they got the ſtart of Sir WILLIAM's, and DARCY's boat kept it by half a ſcore lengths, before the wind, until ſuch time as Sir WILLIAM's was well ſettled in her courſe, and that the men had done running up and down: but then ſhe ſoon paſſed them by, and came to the ſhip near one tenth part of the way before her: ſo that the tacking round, and taking a great ſtretch back into the wind out toward the right hand, he could eaſily perceive, that DARCY's boat, which alſo turned round the ſhip ſome time after her, was clearly baffled by the wind; ſhe not being able to bear up, nor do any thing againſt the wind, although ſhe had done very well before it; but her ſhape of built would not permit this, and therefore they had, by way of ſtratagem, taken two empty barrels aboard them, with deſign to take in ballaſt at ſea, and to fill theſe up, as ſoon as they came to work againſt the wind. Yet, notwithſtanding, they did ſo ill, as that they had near two miles to turn when Sir WILLIAM's veſſel did arrive. And it is affirmed, by ſuch as obſerved their walks, that this firſt courſe was run in half a quarter of an hour.

" We ſhall now tell your lordſhip the adventures of the black boat and the " barge: theſe two, being not ſhaped to ſail with advantage before the wind, were " half a mile behind when Sir WILLIAM's veſſel turned round the ſhip; and " therefore, ſeeing how much ſhe was already on her return, they very fairly, not " going home unto the mark, tacked about; and the black boat performed now " much better than before. Yet, however, that by ill play ſhe turned ſo ſhort, " Sir WILLIAM's men would needs try it with her ſtill; and truly ſhe failed up, " and came ſo near the wind, as that, by theſe following misfortunes, ſhe came " to get before them. Sir WILLIAM's men, for want of dexterity to ſhift their " ſails, ſtopped twice in the wind, and ran back near a quarter of a mile; in one " of which errors, one of the rudders was broken; ſhe alſo grated twice on the " ſhoal ground; and by reaſon of the ſudden flaws of wind, the ſheet of the " main-ſail did ſometimes break looſe; and the men were yet confounded (in this " new way) in the names of the ropes.

" By theſe diſadvantages, the black boat got to tack about before her, where- " of ſhe was ſo proud, as that making too daringly in the eye of the wind, the " violence of it ſnapt off their boom by the board, and ſo the cylinders ſoon paſ- " ſed her by, leaving her to make a pole with the part broken, which helped them " to get home by ſetting.

" As for the barge, ſhe was diſtreſſed by too much wind, and the diſorder of " her ſails did entangle her; ſo that DARCY's boat, that ſailed out the full courſe, " was at a great diſtance off, labouring in the wind. The barge was near half a " mile ſhort, and the black boat could ſail no more.

" So that the præmium was taken down by Sir WILLIAM PETTY's men; and " now they bear it on the main top, as admiral of the cylinders.

" This is the true ſtate of that day's expedition; for the better knowledge of " which, Mr. SOUTHWELL did then, at the match, ſail in her, and does report, " that for the ſtrength of her contexture, he never did perceive the leaſt ten- " dency to a divulſion of the cylinders; but that, on the contrary, the waves, that " roſe up big and ſtrong, fell moſt ſoftly on them; for their rounded ſhapes made " all the force ſlide away on each ſide, ſo as not to make the leaſt contuſion or " balſery. And he ſays, that the objection of her being wind-taught lies much " more ſtrongly againſt her; but for this Sir WILLIAM avouches a perfect re- " medy; and that greater veſſels ſhall be leſs ſubject to it than ſmall ones.

" As for her ſailing againſt the wind, ſhe does it extremely well; ſhe ſtops " well at a tack; ſhe makes way as ſhe looks, without ſinking down the wind; " and comes within leſs than five points of the compaſs; ſome ſay, very much " leſs. And all this we have obſerved in this preſent fabric, of the firſt trial " in this built; with which the men that ſail in her offer to go where any veſſel " of double their burden dare venture, ſhe being a ton and three quarters.

“ And they make another offer, that even now in the winter, with a month's warning, they will give out twenty pieces here, to receive an hundred at their return from Holyhead. And that no man may urge the ſcruple of venturing mens lives, Sir WILLIAM ſaith, that another veſſel ſhall go out with them; and if by the way they at any time call to her for aid, the wager ſhall be acknowledged loſt.

“ MY LORD,

“ Since ours of the 5th inſtant, we have made the above-mentioned experiment, and do atteſt to the truth thereof.

“ Signed by order,

Dublin Jan. 14,
1662.

“ MASSAREENE.”

After reading this report Mr. GRAUNT obſerved, that he had received a letter of a freſher date than that, which contained the above-mentioned report; and that in this letter Sir WILLIAM PETTY mentions, that he had ſo altered his veſſel ſince, that it would now bear 720 ſquare feet of ſail, whereas it carried but 600 before.

Mr. PELL was deſired to peruſe the inquiries and directions for the Eaſt-Indies, and to add ſuch as he ſhould think proper.

Sir ROBERT MORAY having mentioned his having received a letter from Monſieur HUYGENS, it was ordered, that an Engliſh tranſlation of it be made againſt the next meeting, and that the ſcheme contained in it be drawn in great.

February 4. The experiment of the force of falling bodies was tried; but the inſtrument uſed for that purpoſe being defective, Mr. HOOKE, the curator of this experiment, was ordered to have it better fitted againſt the next meeting, and then to repeat the experiment.

The experiment of reſpiring the ſame air was made, both in a glaſs immerſed in cold water, and in a bag. Mr. BALLE reſpired in the glaſs 30 times, Dr. MERRET 36, Mr. HOOKE 13, the operator 56. But here the time was not obſerved. Then the ſame was tried in a bag, where Mr. HOOKE reſpired 19 times in $1\frac{1}{4}$ minute, and Dr. MERRET 76 times in three minutes It was ordered to be made again at the next meeting, in a glaſs immerſed in warm water.

Dr. MERRET related a ſtory of a caulker, who managed his breath ſo well under water, as to ſtay half an hour under it to repair a foundered ſhip.

Sir ROBERT MORAY moved, that as ſome of the ſociety intended to go to the Downs, the experiment of condenſing air in certain glaſſes, ſunk under ſea-water, might be made.

Monſieur Huygens's letter to Sir Robert Moray, dated from the Hague, February 2, 166$\frac{2}{3}$ [k], was read; and the experiments mentioned therein, *viz.* that of the quickſilver ſticking to the finger, and that of the not ſubſiding of water purged from air, were recommended to be made again; the former to Dr. Goddard, in a cane of a leſs bore than formerly; the latter to Mr. Hooke.

Mr. Hook mentioning, that the refraction of water is greater than that of ice, he was deſired to give an account of that experiment in writing.

Dr. Charleton moved, that the eyes of ſome animals might be frozen, in order to ſee their ſtructure the better; and it was ſuggeſted, that this would ſomewhat vitiate the figure of the eye. In the mean time the operator was ordered to freeze ſome cats eyes againſt the next meeting, if the froſt ſhould hold.

It was queried, whether eggs, after they have been frozen, continue fecund; which thoſe members, who had the conveniency, were deſired to try.

Dr. Croune mentioned, that he had ſeen new-laid eggs frozen (though not very hard) without the ſhells being broken.

He offered to make the experiment ſet down by Bartholinus *de Nive*, of putting an egg in Rheniſh wine, to ſee whether and how the cryſtals of tartar gather about the egg.

Mr. Pell, Dr. Pope, and Dr. Croune were deſired to obſerve the next eclipſe of the moon on the 12th of February 1662, and Dr. Croune to write to Dr. Power to do the ſame, and the lord viſcount Brouncker and Sir Robert Moray to obſerve it at Whitehall.

Dr. Croune had the inquiries for the Eaſt-Indies, and the directions for ſeamen, delivered to him to be ſent to the Eaſt-Indies.

Mr. Pell had a copy of the ſame to make additions to them.

February 11. An experiment of the refraction of ice was made by Mr. Hooke, and an account of it given by him in writing, which was read, and ordered to be regiſtered [l]. He was deſired to try it the next day with a glaſs of the ſame figure with the piece uſed by him in the experiment of this day.

The force of falling bodies was tried again, and one ounce falling at the diſtance of leſs than half an inch, and ſomewhat more than a quarter of an inch, moved four ounces. The ſame weight of one ounce, at the diſtance of three quarters of an inch, moved eight ounces; at the diſtance of an inch and a quarter, moved ſixteen ounces; at the diſtance of about an inch and an eighth, did the ſame; at the diſtance of four inches, it moved ſixty-four ounces; and at three inches and a little more, did the ſame.

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[k] Entered into the Letter-book, vol. i. p. 29. See alſo his letter of Feb. 3, 1663, ibid. p. 75.

[l] Original Regiſter, vol. ii p. 149. It is printed in his *Philoſ. experiments and obſerv.* p. 24—26.

Mr. HOOKE was ordered to try this by himſelf at home, as exactly as might be, and to bring in a written account of it at the next meeting.

Dr. MERRET ſhewed a glaſs cane, wherein oil of vitriol was frozen, and contracted into a leſs room.

He affirmed, that he had ſeen eggs frozen, yolk and all, without the ſhells being broken.

He produced a gourd, and a little veſſel of box-wood, both burſt with freezing: He added, that lattin will alſo burſt with freezing.

Some live coals and a chick were ſhut up in a glaſs: the chick, after it had been kept in it 2$\frac{1}{4}$ minutes, was taken out alive and well; but the coals were extinguiſhed about a minute before.

A letter of Sir WILLIAM PETTY to the lord viſcount BROUNCKER, relating to the farther ſucceſs of his new ſhip, was read; and Mr. GRAUNT obſerved, that in a letter to him from Sir WILLIAM it was mentioned, that the ſhip went as near the wind, as by Dr. WREN's braſs inſtrument it was poſſible.

It was ordered, that the ſecretary write in his own name a letter to Monſieur HEVELIUS of Dantzick, to aſſure him of the eſteem, which the ſociety had of his merits, of which he had given ſuch demonſtrations to the learned world in the books publiſhed by him.

Dr. POPE was deſired to recommend to Dr. WREN from the ſociety the continuance of the obſervations of the eclipſes of Jupiter's ſatellites; and himſelf together with Mr. BALLE and Mr. HOOKE to join in the ſame work.

Dr. CROUNE was deſired to try, whether egg-ſhells attract the tartarous part of wine.

The experiment of the mercurial canes adhering to the finger, according to Monſieur HUYGENS's account of it, was referred to Dr. GODDARD to be made at the next meeting.

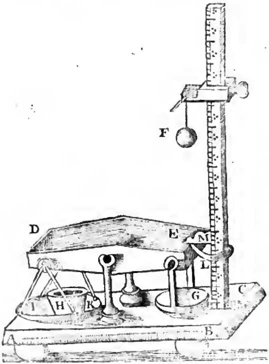
The experiment of reſpiration in warm water was made. The operator reſpired 26 times in 1′ 52″; and Mr. HOOKE 24 or 25 times in 1′ 50″.

Mr. HOOKE propoſed for the next meeting the celerity of falling bodies.

The eclipſe of the moon of February 12th was directed to be obſerved by as many as had conveniency.

February 18. The experiment of the refraction of a priſm in water was made by Mr. Hooke; who was ordered to give an account of it in writing.

His account of the force of falling bodies was read, and ordered to be regiſtered [m], and was as follows:



" ABC the pedeſtal of " the ſcales, DE a double " beam, between the two " cheeks of which the ſteel " ball F falls from a determinate height upon the " ſteel plate G; and if by " that fall it moves the " double beam and the " counterpoiſe H, lying in " the ſcale I K, it gives the " ſmall ſpring L a free paſſage to ſlip between the " end of the double beam " and the ſtay M, by which " means there is given a " certain ſign, whether the " falling body has moved " the ſcale and counterpoiſe " ſo far, as to admit the very " thin edge of the ſpring. " The reſt of the contrivance is obvious enough " from the ſcheme itſelf.

" This inſtrument being " ready, I put into the oppoſite ſcale four ounces, " that is four times the " weight of the ſteel bullet, " and letting fall the bullet an inch above the ſteel plate, I found it to " have moved it, and admitted the ſmall ſpring. I repeated the trials ſo " long, till I found, that letting this ball fall but $\frac{4}{21}$ of an inch above the " plate, it would move the beam ſo as to admit the ſpring; but if I let " it fall from a leſs height, it would not. Then I put in eight ounces " counterpoiſe, and by ſeveral repeated trials, I found $\frac{2}{3}$ of an inch to be " the height requiſite for the falling bullet to paſs before it would move " eight times its own weight. I proceeded further, and from the experiments collected the firſt table A.

A	
$\frac{4}{21}$	4
$\frac{2}{3}$	8
$1\frac{3}{5}$	16
$2\frac{2}{3}$	32
$3\frac{3}{8}$	48
$3\frac{5}{6}$	64
5	96
$6\frac{3}{4}$	128

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[m] Original Regiſter, vol. ii. p. 151.

“ Afterward I took a ſmall ball of clay, that was very round, and exceeding “ hard (it was in weight very near a quarter of an ounce) and proceeding with this ball as I had done with the ſteel, I collected from the “ ſeveral trials a ſecond table B. The firſt row of numbers of both “ tables ſhew the perpendicular height, from which the balls were let “ fall to move the ſeveral counterpoiſes, which are noted by the ſecond “ row of numbers in both tables 4, 8, 16, *&c.* ſignifying the counterpoiſe to be 4, 8, 16 times the weight of the ball.

B	
$\frac{1}{4}$	4
$\frac{3}{5}$	8
$1\frac{4}{5}$	16
$5\frac{4}{5}$	32
18	64
36	128

“ Which trials, though they do not anſwer our expectation as to the accurate exhibiting the ſtrength of a moved body, yet ſeem to prove, that a body “ moved with twice the celerity acquires twice the ſtrength, and is able to move “ a body as big again. Nor are the failings in theſe experiments without ſome uſe: “ for it ſhews us the difficulty of ſuch trials, where, though all things as to our ſenſe “ appear the ſame, yet I find, that ſometimes the ball will move the counterpoiſe, “ when it is let fall from a leſs height than is requiſite to produce the ſame effect “ at another. Whence we need not wonder, if often endeavouring to repeat an “ experiment, delivered upon good credit, as done by another, with ſuch and ſuch “ materials, ſo and ſo uſed, though we do all things juſt according to preſcription, “ yet we miſs in producing the promiſed effect. And therefore, I think it not leſs “ uſeful to ſhew, wherein our preſent trials were deficient, than to declare what “ they ſucceeded in.

“ One defect therefore in our trials ſeems to be, that there is a yielding in the “ materials we made uſe of; as namely, that part of the ſteel ball, which firſt “ touched the plain, is a little flatted, and conſequently a part of the force is returned into the ball, and ſo loſt. Next, there is a yielding in the plate itſelf, and “ the ears of it; every of which yieldings ſeem to take off from the force of the “ body, that it cannot work the effect ſo accurately, as it would, were thoſe removed.

“ Next in this contrivance there is, beſides the counterpoiſe of weights, a great “ deal of maſſy heavy body; namely, the double beam, and the plate and ſcale; “ all which, or at leaſt the greateſt part of it, muſt be moved; and that with a “ very quick and ſudden motion, before the ſpring (though it be ſo very thin) can “ get between the end of the beam and ſtay, ſo as to make the effect ſenſible. “ Now this quick motion itſelf does require a conſiderable ſtrength to effect it, “ were the counterpoiſe removed; for ſuch a bulk of body cannot be put into ſuch “ a quick degree of motion, but by another body, moved with a determinate degree of celerity.

“ Thirdly, the ſcales and counterpoiſe may be all moved, and yet the ſmall “ ſpring not be moved; and though it be ſo thin, as not to exceed a fortieth or “ fiftieth part of an inch in thickneſs, yet is that a ſpace; and the beam may perhaps be moved half that way, and yet the reſiſtance of gravity may make it return before it hath moved the whole ſpace: ſo that it may be moved a little, “ and yet not ſo much as to make it ſenſible by this contrivance. Nor would the “ making the ſpring thinner much mend the matter; ſince there are other incon-

" veniencies, which could not eaſily be avoided. And that this is more than a mere conjecture, the following experiment will make manifeſt: for when by my laſt trial I found the quarter-ounce ball required to be let fall from the height of 36 inches, to move the end of the beam ſo as to admit the ſpring, when the counterpoiſe was 128 times its weight, that I might try, whether the ſame ball would not move the ſame counterpoiſe, though let fall from a much ſhorter height, I played the ſpring ſo, that it was between the beam and the ſtay, but not ſo far as it would ſpring in if it were left free: then letting fall the ball at four inches height, I found, that it had moved the end ſufficiently to let the ſpring ſlide in as far as it would. I put the ſpring again in order as before, and let it fall from three inches and an half, and found it there likewiſe to have moved the beam. I repeated it again at three inches height; but though I tried it ſeveral times, I could not find, that it had at all moved the beam.

" Now as exact trials of this kind may be very uſeful in mechanics, ſo could they be made with bodies perfectly ſolid, would they be for the eſtabliſhment of one of the chiefeſt philoſophical principles, namely, to ſhew the ſtrength, which a corpuſcle moved has to move another; and though DES CARTES put it as a principle, that *ſi corpus C planè quieſceret, eſſetque paulo majus quàm B, quacunque cum celeritate B moveretur verſus C, nunquam ipſum C moveret, ſed ab eo repelleretur in contrariam partem*: yet theſe experiments do ſeem to hint, that the leaſt body by an acquired celerity may be able to remove the greateſt; though how much of its motion is imparted to the bigger body, and how much of it is recoiled into the ſmaller, be not determined by theſe experiments."

Mr. HOOKE was deſired to proſecute this experiment with bullets of the ſame braſs metal to ſeveral diameters, and to obſerve the time withal.

The lord viſcount BROUNCKER was reminded of the experiment formerly recommended to him concerning the firſt velocity of bodies.

The experiment of the celerity of falling bodies, ſhewing exactly the time in which they will deſcend at ſuch and ſuch diſtances, was ordered to be made by Mr. HOOKE.

The experiment of the mercurial cane of a ſmall bore, to try whether it would adhere to the finger or not, was made; and it was found, that it would ſtick to the finger, conformably to Monſieur HUYGENS's account. Dr. GODDARD was deſired to bring an account of it in writing.

Mr. BALLE, Dr. POPE, and Mr. HOOKE were deſired to communicate an account of their ſeveral obſervations of the late eclipſe of the moon.

Dr. CROUNE ſhewed the tartar gathered about egg-ſhells put in Champagne wine; and related, that there were ſix grains of this tartarous ſubſtance gathered about the egg-ſhell, out of half a pint of wine, in the ſpace of twenty-four hours. He was deſired to try it again, and then to give an account of the whole in writing.

Mr. Winthrop was acquainted, that Dr. Goddard would afford him the neceſſary accommodations for the brewing of beer out of bread of maiz.

Dr. Charleton promiſed to ſhew his experiment of killing fiſhes by gagging them.

Mr. Hooke was ordered to bring in a ſcheme of experiments concerning air, both ſuch as had been made already on that ſubject, and thoſe, which ſhould occur to him farther to be made concerning it.

Mr. Colwall offered himſelf to diſcourſe with the governor of the Greenland company, and to procure from him an account of the whale-fiſhing, and other ſuch things, as occur conſiderable in that country.

Mr. Oldenburg acquainted the ſociety with his appointment of a conference with one Mr. Grey, who had been ſeveral times in Greenland; and he was deſired to take in writing ſuch anſwers, as the ſaid Mr. Grey ſhould give to his queries; and to communicate them to the ſociety.

Sir Robert Moray mentioned, that it ſhould be conſidered, whether the Greenlanders might not be aſſiſted with ſome engine, to ſhoot their harp-irons into whales with more force and ſurety.

Mr. Howard related a ſtory of ſtrange exhalations in Lancaſhire, which he was deſired to give in writing.

Dr. Merret ſhewed a certain membranous ſubſtance produced by froſt out of blood ſeparated from its ſeroſity. He was deſired to add it to his experiments of freezing to be brought in writing.

February 25. Mr. Beal's letter to the lord viſcount Brouncker, dated Feb. 16, 166⅘, was read; in which he gave ſome account of the famous hot Baths and the cool ſprings of Wells, from ſeveral deſcents of Mendip-hills in Somerſetſhire; and likewiſe of the ſtrange cave called Wookey-hole in the ſame county: for the fuller account of which he referred to a letter of Mr. Buckland ſent to Mr. Oldenburg, which was alſo read, and the contents thereof referred to the farther examination of ſuch members, whoſe occaſions might call them into thoſe parts the next ſummer, to view and obſerve the ſeveral things mentioned in the ſaid letter. Dr. Wilkins and Mr. Balle offered their ſervice therein to the ſociety.

Mr. Reed was ordered the thanks of the ſociety for his box of cyons of redſtreaks, which he ſent them; and his offer of ſending another ſupply was accepted.

Mr. Howard's relation of a ſulphureous vapour iſſuing out of the earth near Wiggan in Lancaſhire was read, and ordered to be regiſtered[n], as follows:

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[n] Original Regiſter, vol. ii. p. 155.

" I was

"I was there in the beginning of November, after great rains, which had ſo "filled the grounds with water, that there ran a conſtant ſtream in that ditch over "the place, where a vapour did ariſe, which made the water bubble, as if it had "been boiling on the fire.

"I held a candle to the vapour, which immediately flamed above two foot "high, and ſeemed to burn not only above, but in the water. After a little "while (though with ſome difficulty) I extinguiſhed the flame, by throwing water "upon it: then I gave fire to the vapour again, by a lighted piece of paper, and "put it out as before: this I repeated twice or thrice. Then I made a dam above "the place, where the vapour roſe, to ſtop the current of the water, and after a "little time I perceived ſome dead leaves, and little pieces of ſticks (that were "fallen out of the hedge) to burn, notwithſtanding the wet dirt, that was mingled "with them: then I took a green hazel ſtick, and put it to the place, which in a "little time burnt to aſhes.

"Inquiring after the cauſe, I was informed, that there was a coal-pit under that "place, where the vapour did riſe, and that one of the coal-diggers ſearching for "his tool with a candle, as ſoon as he came, where that vapour roſe, it flamed immediately; at which he being very much frighted, he called his fellow-workmen, who put it out by throwing water upon it. Then to ſatisfy their curioſity "they ſet it on fire again, and extinguiſhed it as before; till they grew ſo familiar "with this experiment, that they were no more frighted with it.

"I was informed, that Mr. **Hotham**, who was then miniſter of Wiggan, hearing of this, went to the place, and brought away ſome water from thence with "him; and having diſtilled it, he found, that the vapour had not communicated "any of its quality to the water. The vapour was viſible to me till it was ſet on "fire, with little or no ſcent; the colour of the flame not much differing from "aquavitæ, but much hotter. I am confident it would ſerve very well to boil "meat, and might be very proper for many chemical operations."

Several inquiries concerning Greenland, anſwered by Mr. **Grey**, who had frequented thoſe parts, were brought in by Mr. **Oldenburg**, and ordered to be regiſtered *, and were as follow:

1. "What is the heat of the ſun in the midſt of ſummer in Greenland, compared with the heat of it in England? Anſwer: When calm weather, it is almoſt "as hot as in England, in 78 degrees of latitude, when men are land-lockt, and "in the harbour, where the hills environ them, and cauſe the heat by reflection: "but without at ſea, it is very cold, even in the midſt of ſummer; eſpecially when "the wind blows, or when it is foggy, the ſun then not having his power. The "hotteſt time of the year is the latter end of July.

2. "What is there the moſt conſtant weather in ſummer; whether clear, "cloudy, rainy, or foggy? Anſwer: Some years the weather is clear and moderate,

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* Original Regiſter, vol. ii. p. 156.

“ when the winds hang north-eaſt or eaſt, and do not blow hard: but ſome “ other years the winds hang ſoutherly and weſterly, and then it is foggy and very “ cold. Here falls ſometimes rain toward the middle of Auguſt, and that in the “ valleys, but ſnow on the hills at the ſame time. At the latter end of May there “ is ſtill much ſnow and great cold, and the ſea full of ice about the coaſt, in “ ſome places twenty, in others thirty or forty miles off at ſea from the ſhore; “ after which time the ice is commonly broke up by ſtrong winds, that beat the ſea “ with violence againſt the ice and the frozen coaſt, and ſo free it from the ſame.

3. “ What conſtancy or inconſtancy there is in the winds to this or that quar- “ ter of the horizon, or to this or that part of the year? Anſwer: In May and “ Auguſt, the eaſtern and north-eaſtern winds blow much: in the other months “ they have ſouthern and ſouth weſtern and north-weſtern winds. But generally “ the winds are as various there as here.

4. “ What the temperature of each wind is obſerved to be? Anſwer: The “ north and north-eaſt wind coldeſt, being ſuppoſed to blow from a great tract of “ land, where are abundance of ſnowy hills. The eaſt and ſouth-eaſt pretty “ warm to thoſe in the harbour, becauſe ſheltered by the hills, under which they lie.

5. “ What wind brings moſt ice? Anſwer: The eaſt ſouth-eaſt.

6. “ What currents there are, and which way they ſet, and how faſt? whether “ they always run one way? Anſwer: There is but one conſtant current, which “ ſets away from the eaſt ſouth-eaſt, and runs up to the north north-eaſt as far as “ 77 degrees latitude, where it is check'd; and from thence ſets away again on the “ eaſt ſide of Greenland, between Duke's-Cove and Greenland to the ſouth-weſt; “ and then wheeling about the ſouth point of Greenland, ſets up again north north- “ weſtward to the Foreland of 80 degrees latitude: and then from the ſouth end “ of the Foreland, it drives away to the weſt north-weſt. This current, when “ there is much ice upon the coaſt, is more forcible; but runs very eaſy, when “ the ice is gone from the coaſt. It runs always one way.

7. “ What is obſervable about the tides, ſpring or neap? how high the water- “ mark is above the low-water? which way it flows? which way it ebbs? what “ time of the moon the ſpring-tides are made in? Anſwer: The tides flow from “ the north-weſt to the ſouth-eaſt, and then they ebb back to the north-weſt. “ The ſpring-tides are higheſt about the ſixth tide after the full and change. The “ higheſt tides are but ſix foot; in ſome parts not above three or four foot. The “ ſpring-tides differ from the neap-tides about two foot.

8. “ Whether the ice, that floateth in the ſea, be ſalt-water or freſh? He anſwer- “ eth, He conceiveth it to be only freſh water, that freezeth; the cold forcing the “ ſaline parts away from the ſurface of the water, and the ſnow falling then upon “ it, and chilling the upper part together, which, when it is once ſkinned over, “ abundance of ſnow falling from time to time upon it, and congealing, thickens “ the ice, and at length produceth vaſt iſlands of ice. The ſea-water there is leſs “ ſalt than more ſouthward.

9. " What rivers there are in the ſummer, and what freſh-water can be had? " Anſwer: There is no other freſh water, than diſſolved ſnow falling from the " mountains.

10. " How deep the cold penetrates into the earth? Anſwer: Some ſix or " ſeven foot.

11. " Whether there be any pits or mines? Anſwer: He knows of none but " ſome coal-mines, which he had been digging in, not much beneath the ſurface " of the earth.

12. " At what diſtance they feel the coldneſs of the ice? and what alteration " they find in the air, upon their approach to the ice? Anſwer: At the diſtance of " three or four leagues; when they alſo ſee a kind of glaring in the air, in the " night-time.

13. " What living creatures there be in Greenland? Anſwer: For fowl, abundance " of geeſe and ducks, which cover whole iſlands, and ſit as thick, and lay " eggs, that you muſt tread upon them. Beſides theſe there are pigeons, and a " ſort of fowl called the willock, white-breaſted and black-backed, of the bigneſs " of a duck, building his neſt upon craggy rocks, good to eat, like in taſte to the " heart of an ox. There is alſo ſome ſmall ſtore of grey patridges, and ſome cormorants. " For four-footed animals, there are deer, bears, foxes; the deers grey, " the bears always white, the foxes, ſome dun, ſome white. The bear, where he " lights upon moſt food, there he taketh up his winter-quarters, for which he " watcheth on the ſea-ſhore for the carcaſſes of whales, and carrion of other beaſts, " coming to ſhore there, which he drags out, and layeth together for his food. " The deer ſcrape away the ſnow in the vallies, and under it find ſome ſmall ſuſtenance. " But in ſummer, when the ſun comes there above the horizon, they " have good graſs, which maketh them very fat before ſun ſet. The fox feeds " upon the fowl, which he betrayeth, by feigning himſelf dead, and lying all along " upon his back, and ſtretching out his tongue; at which when the ſilly fowl " picketh, becomes his prey. Theſe animals breed the latter end of May.

14. " What vegetables grow there? Anſwer: Very few: yet ſome flowers " there are, and among them one, that hath the ſcent of a fox; and another ſort " like a round ſtriped bead; and ſome like dazies: ſome others yellow and red. " No fruit.

15. " Whether there be any thunder or lightning in thoſe parts? Anſwer: " None, that ever he obſerved.

16. " How the land trends? Anſwer: It lies away ſouth-ſouth-eaſt, and north-" north-weſt.

17. " What fiſh do moſt frequent thoſe ſeas? Anſwer: Whales; and a peculiar " ſort of them called *Jubartes*, that are very long, which they cannot kill, be-

" ing too ſwift and too ſtrong: beſides theſe, there is the ſea-morſe, having a lion's " look, and ſcales; ſome ſalmon alſo, and a ſmall fiſh like a ſmelt, which the fowl " pick up.

18. " Whether any people do, or have been known to ſtay there all the win-" ter? and how they ſhifted? Anſw. Once they themſelves left there, beſides " their intention, ſeven or eight men, that were gone a hunting; at which time " they weighd anchor, and went along the ſhore, intending to meet them, and " take them in at a convenient place: but a wind and a fog ariſing, which made " them loſe the ſight of land, and forced them to ſea, their poor companions " were left behind, but found alive at their next return; having lived upon fowl " and deer, and ſaved themſelves from being frozen by the coals they found " there.

19. " How near any hath been known to approach the pole? Anſw. He told " me, that once he met, upon the coaſt of Greenland, a Hollander, that ſwore " he had been but half a degree from the pole, ſhewing him his journal; which " was alſo atteſted by his mate; where they had ſeen no ice nor land, but all wa-" ter. This ſeems incredible."

Mr. HOOKE brought in a ſcheme of inquiries concerning the air, according to order, which was as follows [a]:

" For the making a hiſtory ſufficient to direct an able enquirer to find out the " true nature of the air, there will be requiſite,

" Firſt, A diligent ſearch after, and a collection of all the obſervations, as well " as all the experiments, that have been made, and are any where delivered upon " good credit. By which may be had as much of antient and later obſervation, " as thoſe writers have atteſted to poſterity, about the temperature or nature of " the air in ſeveral ages of the world, and in ſeveral parts of the earth.

" Next, A curious and diligent proceſs of making experiments; wherein a " moſt ſevere inquiry may be made into all particulars, both of the manner of " making the experiment, and of the circumſtances obſervable in any of the ef-" effects; and every of theſe trials to be repeated twice or thrice at leaſt, and ſo " recorded and ranged into ſeveral orders or degrees; in every of which places " they may ſtand like ſo many witneſſes, to give teſtimony of this truth, or againſt " that error. And a moſt ſevere examination of theſe witneſſes muſt be made, " before a jury can warrantably give their verdict, or a judge pronounce ſentence, " for branding one propoſition or hypotheſis as erroneous and abſurd, or for eſta-" bliſhing another for a truth or axiom.

" Experiments therefore and obſervations muſt be made, and thoſe of ſeveral " kinds, according to the ſeveral particulars, that are to be enquired into; and

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[a] Original Regiſter, vol. ii. p. 161.

" thoſe particulars may, I think, be well enough reduced to three heads, which " are theſe :

Firſt, Of what ſubſtance, or of what kind of particles the air conſiſts? Whe- " ther infinitely fluid, or definitely ſolid? If ſolid, whether the interſtice between " them be vacuity, or repleniſhed with ſome more ſubtile and fluid body? How " theſe particles are formed, or into what ſhapes they are put, to conſtitute the " body of the air? How generated? from what? by what means? How pre- " preſerved and continued in that form of air? How, and by what means al- " tered and changed? How it differs from other liquors?

" Next, What its quantity or extent is? Whether boundleſs upward, or ter- " minated? And if bounded, How? Whether with or without a determinate " ſuperficies? If with a ſuperficies, Whether it be ſpherical, elliptical, or irre- " gular? How high that ſuperficies, or the air, is extended above the ſurface " of the earth? Whether it be intercepted in the cavities of the earth, in the " ſubſtance of water or other liquors, in the pores of animate or inanimate " bodies, as plants, woods, ſtones; in fleſh or fiſh? Whether fiſh breathe? " Whether it be mixed with the blood or humours of the body? or be the ma- " terial cauſe of animal ſpirits? Whether the air circumveſt or incloſe any of " the planets, or other great bodies of the world? as the moon, which many " ſuppoſe; or the ſun, as KEPLER thinks. What its rarefaction or condenſation " is? By what means effected? What effects it uſually does produce, or to the " effecting of what it may be made uſe of? as for weather-glaſſes, wind-guns, " natural perpetual motions, raiſing water, making ſprings, &c.

" Thirdly, What its qualities or motions are? What its ſpring or elater is? " How cauſed? Whether from an internal or external efficient? To what bounds " it will extend the parts of the air? What ſtrength it has in ſeveral degrees? " What effects it produceth? Whether it hath gravity? What gravity it hath, " compared with other bodies? What is the reaſon of its gravity? How its gra- " vity is increaſed or diminiſhed by rarefaction or condenſation? and by what " degrees? How it comes to riſe from the earth? How it ſuſtains the clouds? " and what peculiar clouds it ſuſtains at ſeveral heights? How it cauſeth vapours " to aſcend? How it keeps two flat bodies together? raiſes and ſuſtains water " and quickſilver at a determinate height, in the Torricellian experiment, and " pumps? How the gravity of the air keeps ſome vapours from breaking out of " the bodies, in which they are? What the reſiſtance of the air is to bodies moved " through it? How much it retards the deſcent of heavy bodies? How much it " ſtops the motion of a pendulum? and whether that be the only cauſe of a pen- " dulum's loſing its motion? How its bears up duſt, ſmoak, &c. How it ſuſ- " tains birds? The ſtrength requiſite to make a wing, or expanded area, ſuſtain a " determinate bulk in the air? And here, what bulk may be raiſed by what kind " of contrivaece? As what by that contrivance, which children uſe to make their " paper kites of? What means may be thought of for raiſing a man; for raiſing " lights to a conſiderable height; for conveying intelligence? What contrivance " may be made for letting bodies fall from certain hights, for knowing the ſwift-

“ neſs of their deſcent? and what other experiments may be tried this way? How
“ it cauſes heat or cold? And what is the moſt natural temperature of the air?
“ What is the temperature of the air in ſeveral parts of the earth? and in ſeveral
“ parts above the ſuperficies of the earth? To what degree it is rarefied upward,
“ and to what degree it is condenſed downward, below the ſurface of the earth,
“ as in deep wells, in mines? or how much it be at the bottom of the ſea, *&c.*
“ Whether it be the medium, that conveys ſound? By what means ſound is conveyed,
“ and how faſt? Whether a wind will refract a ſound? that is, make the
“ ſound ſeem in another place than really it is. How the ſound diminiſhes, according
“ to ſeveral diſtances from the body, that cauſeth it? How much a fair
“ wind helps the progreſs of ſound, and how much a contrary wind hinders it;
“ and by what means? Whether air conveys light? and if ſo, How? How it
“ refracts the rays, and by what degrees? What phænomena may be ſolved by
“ its refraction? Whether it reflect the rays? The cauſes of its reflective quality?
“ What the degrees of it are, compared with that of other bodies? What phænomena
“ of nature will be ſolved thereby? What its conformability or applicableneſs
“ to other bodies is? that is, To what bodies will it readily unite, and to
“ what not? The reaſon of that property? The ſeveral phænomena ſolvable
“ thereby? What the uſe of air is in the   of bodies? What the uſe of it
“ is in reſpiration, both in men, beaſts, birds, inſects, fiſhes, worms, *&c*? What
“ its external motions are? Whether the wind be not certain currents of the air?
“ What the cauſes of thoſe currents or winds are? What the whirl-winds or vortices
“ are, and their cauſes? What the ebbings and flowings of the air are, and
“ their cauſes? What the cauſe of the breeze, and other conſtant winds? What
“ the celerities of winds are? that is, how far ſuch and ſuch a wind will paſs in a
“ minute? The proportion of its ſtrength to its celerity? How much a ſhip
“ loſeth of going as faſt as the wind? How much the clouds are moved ſlower
“ than the ambient air? Whether the air be not moved one way below, and another
“ above? Whether it be not moved ſwifter above than below, *&c.*

“ Every of which queries hint, as well as need, abundance of experiments to
“ clear them. And though ſome few of them will need the diligent obſervation
“ of ſome travellers (eſpecially ſuch, as refer to the temperature of the air and
“ winds, in ſeveral parts of the earth) and cannot well be anſwered by any obſervations
“ or experiments here in England; yet I have inſerted them, becauſe, as
“ I think an account of ſuch obſervations will be very neceſſary for the making
“ an exact hiſtory of the air, ſo I hope, that this honourable ſociety will not want
“ the will, no more than they do the power, to command ſuch obſervations to
“ be made for the future.”

Mr. Hooke was deſired to give in ſuch experiments, as might ſerve for the reſolution of theſe inquiries, and to begin with thoſe, that relate to the firſt head, *viz.* the conſtitution and ſubſtance of the air.

Dr. Wallis being called upon for his account of the experiment, wherein a weight is raiſed by the blowing of a bladder, promiſed to bring it in at the next meeting.

He mentioned a man born deaf, who came to a beginning of hearing by the ſhooting off a great piece of ordnance near him.

March 4. The following experiments, concerning the reſiſtance of air to bodies moved through it, was brought in by Mr. HOOKE [1].

" For the finding out the reſiſtance of the air to bodies moved through it, it " will be neceſſary, that

" Trials ſhould be made with pendulums of all ſorts, whoſe weights ſhould be " made with ſeveral ſorts of materials; as of metals, ſtones, woods, feathers, " wools, *&c.* and theſe faſhioned into ſeveral ſhapes, as round, elliptical, ſquare, " oblong, flat; to be moved flatways, or edgeways, and the like: Then will it be " requiſite to have one common ſtandard or pendulum, by which the celerity and " duration of all the others may be meaſured.

2. " Trials ſhould be made with ſeveral of theſe pendulums; firſt the exhauſted " receiver, where being a much leſs quantity of air, it muſt neceſſarily leſs hinder " thoſe motions; and next, in the receiver, where the air is well compreſſed and " condenſed, and the differences meaſured, as before, and recorded: then the ef- " fects compared with one another, and with thoſe obſerved in the free air.

3. " Trials ſhould be made with bodies of ſeveral ſubſtances; and thoſe of ſe- " veral ſhapes, which ſhould be let fall from ſeveral heights, and the times of " their ſeveral deſcents to be meaſured exactly by a pendulum and recorded.

4. " Trials ſhould be made by ſhooting horizontally, from the top of ſome " high tower, or the like, ſeveral kinds of bodies; and ſo the time to be accu- " rately obſerved, that they remain in the air before they touch the ground.

5. Trials ſhould be made, by ſhooting bodies perpendicularly upward, and ob- " ſerving accurately both the time of their aſcent and deſcent.

6. " Trials ſhould be made, by ſhooting bullets or other bodies horizontally; " and ſo to obſerve both what time they ſpend in paſſing ſuch or ſuch a length; " and likewiſe with what force they hit a mark or body, placed at ſeveral diſtances " from the inſtrument that ſhoots. Theſe trials likewiſe ſhould be made with in- " ſtruments of ſeveral ſtrengths."

Mr. HOOKE was appointed curator of theſe experiments, and to begin with a pendulum ſealed up in a glaſs.

The brewing of beer of barley bread, and of wheaten bread, and of other kinds of grain, as buck-wheat, oats, *&c.* mixed together, was again recommended to Mr. WINTHROP.

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[1] Ibid. p. 193.

Sir William Petty's letter concerning the trimming of the Iriſh black boat for ſwiftneſs was read by Mr. Graunt, who was deſired to give an extract of it at the next meeting.

Dr. Wallis brought in his account of the experiment, wherein a weight is raiſed by the blowing of a bladder; demonſtrating it by the principles of ſtatics applied to the particular caſe; and it was ordered to be regiſtered [r].

Mr. Aubrey preſented the ſociety with the ſcheme of a cart, with legs inſtead of wheels, deviſed by Mr. Francis Potter; which was referred to the conſideration of Mr. Hooke, who was ordered to bring in a report of it to the next meeting.

Francis Potter, B. D. was propoſed as a candidate.

Dr. Croune made mention of a trial of paſſing water through the ſtomach of a man, which ſucceeded, he ſaid, as well as it had done through a bladder. He was deſired to join theſe two experiments together.

He brought in a paper concerning cider, the reading of which was deferred till the next meeting.

March 11. Mr. Winthrop preſented ſome bottles of beer brewed of Maiz-bread, which was a pale, well-taſted, middle beer. He was deſired to keep ſome of his liquor for a while, to ſee how it would bear age. Being aſked what proportion of Maiz there had been taken to the eight gallons of beer which was brewed, he ſaid, about half a buſhel.

Dr. Merret moved, that ſome ſpirit might be drawn out of this Maiz-beer a fortnight after.

Dr. Croune brought in a paper of Mr. Newburgh's concerning cider; which was read, and ordered to be filed up with the others formerly brought in upon the ſame ſubject.

He was reminded, to bring in an account of keeping carps alive for a while out of water, by feeding them in a cellar.

Mr. Pell mentioning a ſort of perry ten years old, which he had drank in Turgow, boiled till two thirds were waſted, and having a muſcadel taſte, Dr. Merret took occaſion to ſay, that he conceived, that with the boiling a good quantity of ſpirits exhaled. But Dr. Goddard was of opinion, that any wort, or muſt, or juice of apples or pears, &c. being boiled before they are fermented, or being put into a ſtill, will only yield phlegm, and very little ſpirit.

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[r] Original Regiſter, vol. ii. p. 166.

Dr. Hoare moved, that it might be tried, whether juices, before fermentation, loſe their ſpirit.

He mentioned, that the liver of a pigeon had been found full of peaſe.

Mr. Buckland's paper ſent to Mr. Oldenburg, concerning the way of brewing beer without malting the corn, and of turning rich cider into a kind of canary, was read; whereupon the lord Berkeley offered the ſociety ſome beer made of unmalted barley.

Sir Nicolas Criſpe was propoſed as a candidate by Mr. Colwall.

March 18. Mr. Winthrop acquainting the ſociety with his intention of returning ſoon to New England, was deſired to take to take with him a copy of the directions for ſeamen; and to make as many of the obſervations and experiments contained therein as he could. The amanuenſis wa ordered to have the ſaid copy ready for him againſt the next meeting; and the operator to have a dozen ſounding leads, and three our four balls, made againſt that time; as alſo the cylindrical veſſel with valves, to fetch up water from the bottom of the ſea.

Sir Robert Moray moved, that the ſame directions, together with the ſame ſounding balls, might be recommended to major Holmes, who was ready to go for the ſtraits.

Mention being made again, that liquors boiled or diſtilled before fermentation yield no ſpirits, or very little; it was alledged, that a certain brewer received all the exhalations of the beer and ale, which he brewed, thinking to make a conſiderable gain of the ſpirit, which he ſuppoſed it would yield; but it proved all phlegm.

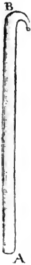
Mr. Hooke ſuggeſted, upon this occaſion, that urine diſtilled before it is fermented yields no ſpirit at all.

Mr. Hooke's account of the cart with legs, brought in by Mr. Aubrey from Mr. Potter was read, and ordered, with ſome alterations, to be ſent to the author of this invention.

Mr. Hooke was alſo ordered to draw up a full deſcription of this cart, together with a ſcheme of it, that it might be entered with the animadverſions up it.

Mr. Oldenburg acquainted the ſociety with a letter ſent him from Mr. Buckland, a Somerſetſhire gentleman; wherein was propoſed a way of preventing famine, by diſperſing potatoes throughout all parts of England. The heads of the letter were read, and a committee appointed to conſider of all the particulars thereof, and to make a report to the ſociety. The committee named were, Mr. Howard, Mr. Boyle, Mr. Brereton, Sir Robert Moray, Dr. Wilkins, Dr. Goddard, Col. Tuke, Mr. Evelyn, Mr. Balle, Dr. Merret, Dr. Whistler, Mr. Henshaw, and Mr. Oldenburg; who were to meet on the 20th of March, at three in the afternoon, at Mr. Howard's lodgings in Arundel-houſe.

The lord viſcount **Brouncker**, Sir **Robert Moray**, and Mr. **Bruce** brought in an account of the obſervations and experiments, which they had lately made upon the river of Chatham; and his lordſhip promiſed to add to them ſome notes of his own. The paper was ordered to be regiſtered[e], and was as follows:



" There was a glaſs tube taken A B C, about 23 inches long, and near " $\frac{3}{4}$ of an inch over: this was cloſe ſealed up at the one end A, and the " other end B was drawn into a very ſmall pipe C, and bended accord- " ing to the ſhape in the figure. This pipe weighed 874 grains, and " and being filled with ſalt-water, and the outſides wiped dry (which was " conſtantly done in all the ſubſequent trials) it weighed 2140 grains; " whence deducting the weight of the pipe, 874, we have 1266 grains, " the weight of the water that filled the pipe. This pipe was ſo faſtened " to a line, with a leaden plumbet to ſink it, that it ſunk perpendicu- " larly, with the ſealed end of the pipe foremoſt; by which means the " ſmall hole of the pipe C was opened downwards (that hole being made " purpoſely ſmall, that the air might not get out whilſt the water got in, " nor the water get in when the air forced its way out). Then the glaſs " was for a ſhort time ſo held in the water, that all of it, except the " ſmall bended pipe, was covered with the water, which was likewiſe " obſerved in every trial (to the end that the air within the pipe might " be well cooled): then let down to the bottom of the water, and there " ſuffered to ſtay a little while; afterwards, being drawn up, looſened from " the line, dried, and exactly weighed, it was found to weigh 1833 " grains; whence deducting the tube 874, we have 959 grains, the " weight of the water it brought up. Then meaſuring the depth of the " water by the line by which we had let down the glaſs, we found it ſixteen " fathom and a foot, or ninety-ſeven foot. This and the following trials were " made the 11th of March 1662, in the channel to the north of Queenborough.

" In the following table, A the depth of the water, noted by feet from the mouth " of the pipe to the top of the water.

" B the weight of the pipe and water.

" C the weight of the pipe.

" D the weight of the water.

" E the complement of that weight, to the weight of the water that filled the pipe.

" F the ſame with A.

" G the height of a pillar of ſalt-water, which each of the experiments ſeemed " to infer, that was able to counterballance the preſſure of the atmoſphere, or to " condenſe the included air into $\frac{1}{2}$ its firſt ſpace; the proportion being as D to E, " ſo F to G.

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[e] Original Regiſter, vol. ii. p. 208.

Full

A		B		C		D	E		F	G	
Full.	foot.	2140	—	874	=	1260.	000	::	00	00	
97		1833	—	874	=	959.	307	::	97	. $31\frac{56}{959}$	
97		1832	—	874	=	958.	308	::	97	. $31\frac{72}{479}$	
$6\frac{4}{11}$		1000	—	874	=	186.	1080	::	$6\frac{4}{11}$	. $36\frac{10}{11}$	—
$14\frac{7}{11}$		1257	—	874	=	383.	883	::	$14\frac{7}{11}$	. $33\frac{6}{11}$	+
$31\frac{1}{11}$		1500	—	874	=	626.	640	::	$31\frac{1}{11}$	. $31\frac{9}{11}$	+
$64\frac{1}{11}$		1737	—	874	=	863.	403	::	$64\frac{1}{11}$	. $29\frac{11}{11}$	+
66		1734	—	874	=	860.	406	::	66	. $31\frac{34}{215}$	
33		1530	—	874	=	656.	610	::	33	. $30\frac{10}{41}$	
$16\frac{6}{11}$		1296	—	874	=	422.	844	::	$16\frac{6}{11}$	. 33	
$8\frac{3}{11}$		1131	—	874	=	257.	1009	::	$8\frac{3}{11}$	. $33\frac{1}{11}$	+

" Theſe trials were made the next day with the ſame glaſs cylinder.

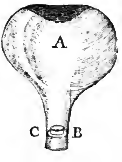
	A		B		C		D	E		F	G	
This was made juſt at high-water.	$8\frac{3}{11}$	foot.	1172	—	874	=	298.	968	::	$8\frac{3}{11}$	. $26\frac{10}{11}$	+
	$8\frac{3}{11}$		1131	—	874	=	257.	1009	::	$8\frac{3}{11}$	. $32\frac{4}{11}$	+
	$16\frac{6}{11}$		1300	—	874	=	426.	840	::	$16\frac{6}{11}$	. $32\frac{6}{11}$	+
	33		1510	—	874	=	636.	630	::	33	. $32\frac{73}{106}$	
	$49\frac{6}{11}$		1635	—	874	=	761.	505	::	$49\frac{6}{12}$	. $32\frac{645}{761}$	
	66		1712	—	883	=	428.	428	::	66	. $33\frac{397}{419}$	

" Theſe trials did agree by meaſure with ſome trials at the ſame depth, that I " made early in the morning.

" A bundle of corks being knit up in a handkerchief, and faſtened to the line at " 33 foot from the ſmall end of the glaſs, the tube was again let down to the ſame " depth, and the corks floating upon the water ſuſpended it at that depth for a " good while: afterwards we drew up the cylinder, and meaſuring it, we found it " to agree with the laſt experiment made at that depth. But we did not weigh it.

" We repeated the laſt trial at 66 foot, becauſe that was made, when the water " had a pretty ſtrong current, and the ſtring ſeemed to ſtream a good way from " the perpendicular; to prevent which inconvenience, the boat was ſuffered to " drive with the current, by which means the line ſeemed to go down perpendicularly into the water; ſo the cane being pulled up, after it had remained ſome " time at the depth of 66 foot, it weighed 1719—874=845.421::66.$32\frac{744}{845}$ " let down to $82\frac{1}{2}$ foot deep: and ſuffered to drive as the former, it weighed " 1883—874=1009.257::$82\frac{1}{2}$.$21\frac{135}{10090}$.

" Wedneſday, March the 11th, in the afternoon, near the ſame place, where the " former trials were made, we tried theſe following experiments of compreſſion:



“ Unto the neck or mouth B, of a common quart-“ bottle A, was fitted a valve C, that opened inward “ and ſhut outward. This bottle was let down in the “ poſture you ſee it, with the mouth foremoſt; whence “ the water had, as the bottle was ſinking, free paſſage “ into it to condenſe the air. But as ſoon as the water “ was got in, the valve ſhutting, hindred it from getting “ out, though the bottle were pulled up. The bottle “ when empty weighed $37\frac{7}{8}$ ounces, and 24 grains; or “ 18204 grains: filled with ſalt-water, it weighed $78\frac{1}{4}$ “ ounces and 3 grains; or 37563 grains: whence taking “ the weight of the bottle 18204, we have 19359 “ grains for the weight of the water that filled the bottle. “ This bottle, let down $13\frac{1}{2}$ fathom by the ſhip's plumb-line, or 81 foot, the valve “ was ſo hard ſhut, when it was taken up again, that it was difficult to thruſt it “ open: tho' when the mouth C B was ſet upward, the valve being made of braſs “ without leather, we found it manifeſtly to leak air, by the hiſſing noiſe it made “ in getting out; and when by a knock the valve was beaten down, the air made “ a noiſe in ruſhing out, like that of a bottle of ale when it flies. The bottle, and “ the water it brought up, weighed $65\frac{19}{20}$ ounces, or 31656 grains; whence de-“ ducting 18204, we have the weight of the water 13452.

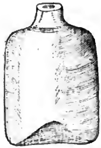
“ This bottle was again let down to the depth of 14 fathom, or 84 foot; and “ being drawn up, was found to weigh, whilſt the compreſt air remained in it, “ $65\frac{1}{8}$ ounces and 19 grains, or 31279 grains: when the air was let out, it loſt 21 “ grains of its former weight, counterpoiſing only 31258 grains; which was ſup-“ poſed to proceed partly from the freezing of the compreſſed air, and partly from “ the loſs of a little water, that the violent eruption of the air had blown away: “ from which ſum deducting 18204, we have 13054 for the weight of the water.

“ March the 13th another experiment was made, with another bottle of the “ ſame kind, which empty weighed $37\frac{13}{16}$ ounces and 12 grains, or 18162 grains; “ filled with ſalt water to the valve, it weighed 37353 grains; whence deducting “ 18162, we have 19191 grains, the weight of the water that filled it. This bot-“ tle being let down 8 fathom, or 48 foot, the bottle of compreſſed air and water “ together weighed 29142 grains: after the air was let out ſoftly, is was found 24 “ grains lighter, or 29118; whence deducting the bottle 18162, we have 10956 “ grains for the water.

“ The bottle with a bended copper-pipe at the top, being let down $8\frac{1}{2}$ fathom, “ brought up in it $4\frac{13}{16}$ ounces and 24 grains of water. The bottle itſelf being “ before counterpoiſed; the ſame kept a longer time at the ſame depth, brought up “ $8\frac{9}{16}$ ounces 25 grains of water; the ſame kept yet longer a great deal, brought up “ $9\frac{3}{16}$ ounces and 6 grains: the water that filled the bottle weighed $41\frac{14}{16}$ ounces and “ 24 grains; which different proportions of water taken in, we judged to proceed “ either from the leaking of the veſſel at the ſcrew, by which means the water had “ a paſſage into the bottle, below the mouth of the bended pipe, which would there-“ fore ſerve for a vent-hole for the air to get out at; or elſe, that the motion of

“ the top of the water being a little uneven, firſt the preſſure upon the bottle, though fixed in the ſame place, muſt conſequently alter; next the bottle itſelf was by the cockling of the boat ſometimes lifted higher, and then let lower: both which irregularities muſt neceſſarily alter the height of the preſſing pillar; whence, as the preſſure was increaſed, the water got in; and, as it decreaſed, the air got out. And without doubt many ſuch changes would in time quite fill the bottle.

“ *Experiments of the weight of water.*



“ A white glaſs vial, much in the ſhape deſcribed in the figure, with a ſmall ſhort neck, weighed, when empty, 1425 grains; filled exactly full with ſalt-water, it weighed 5247 grains: whence 1425 being deducted, we have 3822 grains, the weight of the water. The ſame filled with freſh water taken out of the Thames at Greenwich, near low water, weighed 5164 grains; whence deducting 1425 grains, we have 3739, the weight of the freſh. And weighing afterward the water wherewith the ſtrong ale at Margate is brewed, we found it exactly the ſame with this Greenwich water. Whence we conclude the proportion of theſe freſh waters to this ſalt, to be as 3739 to 3822; that is, near as 45 to 46.

“ *Experiments of the heat and cold of the water.*

“ A ſealed-up thermometer, much of the ſhape of that in the figure, was let down to the bottom of the water, at the depth of ſixteen fathom and a foot, and there ſuffered to ſtay a good while, that the coldneſs of the water might condenſe the included liquor ſo far, as to ſuffer the air to get into the bigger ball, which was therefore placed uppermoſt. But though the thermometer was ſuffered to lie a good while at that depth, and then ſuddenly pulled up, we could not find, that it had any whit more condenſed the liquor, than the ſame would be by being kept a good while under the ſurface of the water at the top. Whence we judged the temperature of the water, both at the top, in the middle (for by other trials we found the ſame at other depths) and at the bottom, to be the ſame.

“ *Obſervations of ſound.*

“ Being at a place of the Thames, about four miles above Graveſend, there happened to be ſhot off ſeveral pieces of ordnance, by a ſhip half a mile further up the river; the multitudes of echos from each of which made a noiſe much reſembling thunder; which, could they have been numbred, would have amounted to ſeveral ſcores, if not hundreds. And diligently obſerving ſince the noiſe of thunder, it ſeemed to me to be partly made by echos from the clouds: which would ſeem more plau-

" ſible, if by any means we could certainly find the clouds to echo a ſound. A " gun being afterward ſhot off by the veſſel we were in, when we were near the " mouth of the Thames, and ſeveral ſhips being on this and that ſide of us, we " could ſenſibly hear ſeveral echos rebounded from them."

Mr. Aubrey mentioned, that he had been informed, that the duke of Orleans had a way of producing animals by the putrefaction of vegetables. Sir Robert Moray promiſed to aſk Dr. Morison [t] concerning it.

This gave occaſion to diſcourſe again of equivocal generation, and to deſire thoſe members, who were, on the 22d of October, 1662, charged with making experiments concerning the ſame, to diſcharge their undertaking: and to them were added Dr. Goddard, Dr. Whistler, and Mr. Evelyn, the laſt of whom undertook particularly to put ſeveral pieces of fleſh and ſome blood in a cloſed veſſel, which might not be fly-blown, to ſee what it would produce. Dr. Goddard likewiſe engaged to try what would be produced by ſack poured upon good cheeſe.

Sir Nicholas Crispe and Mr. Francis Potter were elected.

It was reſolved, that Mr. Evelyn's treatiſe concerning timber-trees and fruit-trees be printed by order of the Royal Society, upon peruſal of it by Dr. Wilkins, Dr. Goddard, and Dr. Merret, who were deſired to peruſe it accordingly.

1663. *March* 25. The experiment of purging water from air not ſucceeding, the engine not being tight, it was ordered to be tried again at the next meeting; and likewiſe the experiment to be made again, how long a fiſh will live in water thus freed from air; and the celerity of a falling body in a long glaſs, exhauſted of air. Mr. Hooke was appointed curator of theſe three experiments.

The lord viſcount Brouncker promiſed to bring in at the next meeting his notes of the obſervations lately made by him and Sir Robert Moray at ſea.

Dr. Croune ſhewed an egg-ſhell put into Champagne wine, and covered with a kind of tartarous ſubſtance. He was deſired to bring the account of it in writing, as alſo that of the carp fed out of water.

Mr. Winthrop received a copy of the directions for ſeamen; and the operator was ordered to make ready for him, as ſoon as he could, thoſe wooden balls and leads, for which he had orders before.

The amanuenſis was ordered to make another copy of the ſame directions for major Holmes.

Sir Robert Moray, Dr. Wilkins, and Mr. Hooke were deſired to be curators of trying the two ſorts of cylindrical veſſels for the fetching up of water from the bottom of the ſea.

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[t] Robert Morison, M. D. author of the *Hiſtoria Plantarum*. He had been phyſician to the duke of Orleans. Wood's Faſti, Oxon. vol. ii. col. 178.

The committee appointed to conſider of Mr. Buckland's letter made a report, *viz.* that the ſaid letter was read before them, containing a propoſition to plant potatoes through all the parts of England, together with the way of ordering them, and the benefit thereof in time of ſcarcity of food: And that hereupon ſeveral members of the committe had confirmed the ſubſtance and particulars of the ſaid letter, concerning the ſoil fit for them, their diffuſiveneſs, their uſefulneſs for meat and bread, their proſpering as well in ploughed as in delved land; the eaſineſs of defending them from froſt by any refuſe, *&c.* And that therefore the committe had approved of the ſaid propoſition with this reſult: 1. That all thoſe members of the ſociety, who had land, ſhould be deſired to begin the planting of this root, and to perſuade their friends to do the ſame. 2. That in order thereunto Mr. Buckland ſhould be deſired, if he had any quantity to ſpare, to ſend up ſome, to furniſh thoſe, who had conveniency to plant them; Mr. Howard and Mr. Boyle offering themſelves to procure as many of them, as they could for that purpoſe.. 3. That Mr. Boyle ſhould be deſired to communicate to the ſociety thoſe obſervations and notes, which he had made upon this root, the manner of planting it, and the diffuſiveneſs of the ſeminal virtue thereof. 4. That Mr. Evelyn ſhould be deſired to join this propoſition by way of appendix to his diſcourſe of timber-trees.

This report being made, the ſociety approved of all the particulars of the reſult of this committee, and accordingly recommended this work to their members, ordering withal, that thanks ſhould be returned to the author of this propoſition for his reſpect to the ſociety, and care of the public good.

Dr Wilkins gave an account of the way and benefit of ſetting corn by a peculiar engine; and was deſired to ſend for it from Oxford, and to communicate to the ſociety in writing the ſubſtance of what he had related to them this day concerning this matter.

Sir Robert Moray mentioned, that he had aſked Dr. Morison concerning the production of animals by the putrefaction of vegetables, ſaid to have been done by the duke of Orleans; but the doctor knew of no ſuch thing.

Mr. Evelyn was put in mind of the experiment committed to him of cloſing up blood and pieces of fleſh, to ſee whether it would produce any inſects.

Sir Robert Moray, Col. Tuke, and Dr. Wilkins were appointed curators of the experiment of producing maggots by cheeſe and ſack.

Dr. Croune ſuggeſted, that the viper powder, formerly committed to the care of Mr. Pulleyn, might be looked after; and that Mr. Pulleyn ſhould be deſired to obſerve the proper time, wherein it was thought that vipers would be produced out of that powder.

Mr. Hooke was ſolicited to proſecute his microſcopical obſervations, in order to publiſh them.

Sir **Robert Moray** brought in a poiſoned dagger preſented to his majeſty from an Indian king by the captain of the ſhip Truro, lately returned from the Eaſt-Indies. The dagger was warmed, and with it blood was drawn from a kitten, to ſee whether it would be killed thereby. The kitten not dying whilſt the ſociety was together, the operator was appointed to obſerve what ſhould become of it. The dagger was committed to the care of Dr. **Goddard**.

It being mentioned, that a certain ſpirit extracted out of tobacco was by ſome conceived to be a ſubtle poiſon, it was debated, whether ſome ways of extracting ſuch a ſpirit ſhould be tried; and it was thought fit to defer it till the ſociety heard from Sir **John Finch**[u], to whom the care of this matter was recommended.

A fiſh was put in a glaſs with water, cloſed up with lime, in order to ſee how long it would live ſo, the air being excluded from it.

Sir **Robert Moray** mentioned, that Monſieur **Le Febure** had made the experiment formerly committed to him, of holding ſalt of tartar both in hot water, and in the ſteam of hot water. Sir **Robert** was deſired to ſpeak to the curator of this experiment, to bring it in writing to the next meeting.

Sir **Robert Moray** having acquainted the company, that Sir **Henry Bennet**, ſecretary of ſtate, had procured his majeſty's hand to the patent[w], it was ordered, that the lord viſcount **Brouncker**, Sir **Paul Neile**, and Mr. **Aerskine** ſhould give Sir **Henry** the thanks of the ſociety for this favour and care.

James Long, eſq; was propoſed as a candidate by Col. **Tuke**.

April 1. An account was given of the conſtruction of the pneumatical engine, as it then was; which was ordered to be brought in writing, together with a ſcheme of the engine, by Mr. **Hooke**.

Water was purged from air by the ſaid engine, and Mr. **Hooke** was appointed to make the experiment of Monſieur **Huygens** of the not ſubſiding of ſuch water, according to the Torricellian experiment, againſt the next meeting.

The experiment of the exhauſting the air from a fiſh in water was tried in the engine; whereby the fiſh, which was a tench, was put into much diſorder, and buoyed up to the upper part of the water, when he would ſink; his eyes alſo ſwelling and ſtanding out. The operator was ordered to obſerve the fiſh, and how long ſhe would live after the exhauſting of the air; the experiment being directed to be tried again at the next meeting, together with that of the celerity of falling bodies in a glaſs exhauſted of air.

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[u] He was a fellow of the ſociety, and had been knighted by the king on the 10th of January, 166$\frac{0}{1}$. Dr. **Ward**'s Lives of the profeſſors of Greſham College, p. 228.

[w] The ſecond charter granted to the Royal Society, which paſſed the privy ſeal April 22, 1663.

An account was given of the tench ſhut up cloſe with lime in a glaſs with water, *viz.* that it had been taken out the next morning, after fourteen or fifteen hours, and found alive. Dr. GODDARD was deſired to repeat the experiment, and to fill the glaſs full of water, and to leave the fiſh in it a longer time, *&c.*

Major HOLMES received a copy of the directions for ſeamen by the hands of the operator; and Mr. HOOKE was appointed to wait on the ſaid major, and to direct him in the uſe of the balls and leads for ſounding without a line, and of the cylindrical veſſel for fetching up of water from the bottom of the ſea.

Mr. HOOKE was charged to bring in at every meeting one microſcopical obſervation at leaſt.

The kitten wounded at the laſt meeting with the poiſoned dagger, ſent from the Eaſt-Indies, was produced alive.

It was ordered, that Monſieur LE FEBURE ſhould be deſired by Sir ROBERT MORAY to give an account of the ſalt of tartar, held both in warm water, and in the ſteam thereof.

The lord viſcount BROUNCKER related a ſtory of a lady recovered from a conſumption by drinking ale or beer brewed of water, that ran over a ſlate-pit; which occaſioned ſome diſcourſe concerning the virtue, which might be communicated by ſlate, as is done by bole or chalk.

His lordſhip likewiſe mentioned a way uſed by Mr. LE FEBURE of making a powder of ſpunges, imbibed with a water diſtilled from the ſame, very good to cure the ſtruma, and ſuppoſed to be performed by the volatile ſpirit contained in that powder. Of the former Sir ROBERT MORAY could give a fuller account, and of the latter Mr. LE FEBURE.

There was read a letter ſent from a French gentleman, Monſieur DE LA QUINTINYE, to Mr. OLDENBURG, dated at Paris March 2, $166\frac{2}{3}$, N. S.[x] concerning the cutting and whole method of ordering melons, after they are come up The writer of this letter, at the cloſe of it, offering likewiſe his ſervice to the ſociety, it was ordered, that thanks ſhould be returned to him for his civilities.

The ſociety being made acquainted alſo with this gentleman's extraordinary ſkill in the cutting and the whole method of the culture of fruit trees, and with his having written ſomething upon that ſubject; it was farther ordered, that he ſhould be deſired, in the name of the ſociety, to communicate to them his obſervations, which they would have annexed to Mr. EVELYN's diſcourſe of timber-trees ready to be publiſhed, owning Monſieur DE LA QUINTINYE to be the author of thoſe obſervations.

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[x] Letter-book, vol. i. p. 79.

Mr. Hooke's paper concerning the Chineſe cart with one wheel, mentioned by Martinius in his *Atlas Sinenſis*, was read, and diſcourſed upon, that the ſaid cart was like a wheel-barrow: and the paper was ordered to be filed up.

Dr. Wilkins made mention of a certain inſtrument like an umbrella, to be uſed inſtead of an anchor in fathomleſs ſea, and to ſtay a ſhip in a ſtorm, or upon other occaſions.

Mr. Long was elected.

Thomas Sprat, M. A. was propoſed as a candidate by Dr. Wilkins, and Edward Cotton, D. D. by Mr. Balle.

April 8. The operator gave an account of a tench tried in the pneumatic engine; that after an hour and an half he opened the glaſs, whereupon the fiſh ſunk to the bottom immediately, and being taken out was found dead; and upon being opened, its bladder was diſcovered to be burſt. He was directed to give an account of this in writing.

The like experiment was tried upon two young eels, but they ſeemed not ſenſible of the exſuction of the air. Order was given for trying theſe two experiments again at the next meeting.

Mr. Hooke ſhewed the company a ſcheme of the appearance of common moſs in a microſcope. He was deſired to continue, and againſt next meeting to have ready, the microſcopical appearance of the little fiſhes in vinegar.

Mr. Boyle brought in a written account of potatoes from his gardiner, which was ordered to be entered [y], and is as follows:

" SIR,

" I have, according to your deſire, ſent a box of potatoes. My care hath been " to make choice of ſuch, that are fit to ſet without cutting; for many, that have " not ſmall ones enough, are conſtrained to cut the great ones: but I do not " approve of that huſbandry, neither do I make uſe of it, becauſe, when they are " cut, the worms do feed on them; and ſo devouring the ſubſtance, the branch " groweth the weaker, and the root ſmall. The ground, which they thrive beſt " in, is a light ſandy earth, where fern or briars do naturally grow. Their nature " is not to grow fruitful in a rich ſoil, becauſe they will ſpring forth many " branches, and ſo incumber the ground, that they will have but ſmall roots. " You may cauſe them to be ſet a foot apart, or ſomething better, whole as they " are, and there will be a great increaſe, and the branch will bring forth fruit, " which we call the potatoe-apple. They are very good to pickle for winter ſallads, " and alſo to preſerve. I have taſted of many ſorts of fruit, and have not " eaten the like of that: they are to be gathered in September, before the froſt " doth take them. If you are minded to have great ſtore of ſmall roots, which

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[y] Letter-book, vol. i. p. 83.

“ are fitteſt to ſet, you may cauſe them to lay down the branches in the month before
“ named, and cover them with earth three or four inches thick; and the branch
“ of every joint will bring forth ſmall roots in ſo great a number, that the increaſe
“ of one yard of ground will ſet twenty the next ſeaſon: And it muſt be the care
“ of the gardiner to cover the ground where the roots are with fern or ſtraw,
“ half a foot thick, or better, at the beginning of the winter, otherwiſe the froſt
“ will deſtroy the roots; and as they have occaſion to dig out the great roots,
“ they may uncover the ground, and leave the ſmall ones in the earth, and cover
“ them as before, to preſerve ſeed. Now the ſeaſon for digging the ground is in
“ April or May, but I hold it beſt the latter end of April; and when they dig
“ the ground, let them pick out as many as they can find, ſmall and great, and
“ yet there will be enough for the next crop left. Let the covering, which they
“ are covered withal, be buried in the ground; and that is all the improvement
“ that I do beſtow. I could ſpeak in the praiſe of the root, what a good and
“ profitable thing it is, and might be to a commonwealth, could it generally be
“ experienced, as the inhabitants of your town can manifeſt the truth of it; but
“ I will be ſilent in ſpeaking in the praiſe of them, knowing you are not ignorant
“ of it.”

Mr. PALMER preſented the ſociety with ſome oil-ſeeds, eſteemed to be the *ſeſamum*, brought out of Syria, yielding very good oil. Mr. HOWARD and Mr. EVELYN took ſome of theſe ſeeds with them, promiſing to ſow them.

Mr. EVELYN mentioned, that he cloſed up ſome pieces of fleſh, and ſome blood, *&c.* and expoſed them, in order to ſee what inſects would be produced from thence.

Dr. MERRET promiſed to bring in, a fortnight hence, his experiments of freezing.

Monſ. LE FEBURE brought in two vials, both containing ſome ſalt of tartar, and hermetically ſealed up; whereof one had been put and kept awhile in warm water, but ſuffered no viſible alteration, nor ſtuck to the ſides of the glaſs; whereas the other, that was only held in the ſteam of the warm water, without immerging it therein, had the ſalt ſticking to its ſides, the ſubtil aqueous vapours ſeeming to have been able to penetrate where the water itſelf could not. He was deſired to repeat the experiment, wherein the ſalt adhered to the ſides of the glaſs.

He communicated likewiſe a certain volatile ſpirit, which he ſaid he had drawn from ſponges, having the ſcent and taſte of hartſhorn ſpirit; and that it was an excellent remedy for all ſtrumous ſwellings.

The ſtory of a cure done upon a lady in a conſumption by a mineral ſlate-water being repeated by Sir ROBERT MORAY, Monſ. LE FEBURE aſſerted, that ſlate had a vitriol and ſulphur in it, which, by infuſion, communicated its virtue; and he promiſed to produce ſome of it before the ſociety, and to give in writing the proceſs of drawing ſuch vitriol and ſulphur out of the ſlate.

Monſ. Le Febure gave likewiſe an account of a mixture of ſalt of tartar and alum, yielding a ſtrange ſtinking ſpirit, and incruſting the recipient with a black ſubſtance. He was deſired to bring his diſcourſe thereof in writing.

Mr. Hooke was ordered to prepare, for the next meeting, the two experiments of water purged from air; and of the deſcent of bodies in an exhauſted receiver.

April 15. Mr. Long and Dr. Cotton were admitted into the ſociety.

Anthony Lowther, eſq; was propoſed as a candidate by Dr. Wilkins.

Mr. Sprat was elected.

The operator was directed to have ready, againſt the next meeting, ſeveral ſorts of fiſhes, to be tried again in the pneumatical engine: And

To put up ſome fry of fiſh in a glaſs with water luted up, and to ſee how they would thrive there.

It was mentioned by him, that clay put into the water, after the pumping out of the air, revived the carp therein.

Mr. Pell remarked, that lampreys tranſported out of England into Holland, and not ſtirred continually, die, and ſo ſhine not, for the catching of cod-fiſh.

Mr. Hooke ſhewed two microſcopical ſchemes, one repreſenting the pores of cork, cut both tranſverſe and perpendicular; the other a Kettering-ſtone, appearing to be compoſed of globules, and theſe hollow ones, each having three coats ſticking to one another, and ſo making up one intire firm ſtone.

He was deſired to examine the barks of other trees, and to write down all that he ſhould obſerve about theſe and the like appearances; and alſo to bring in to the next meeting the repreſentation of the little fiſhes ſwimming in vinegar.

Dr. Wren was deſired to communicate what he concluded from the earl of Sandwich's obſervations: And

To give order to the operator for the making of the engine for the ſetting of corn, and to deſcribe what the advantages of it are, or have been found to be by former experiments.

Mr. Hooke was appointed to continue the obſervations of the ſatellites of Jupiter, as he had opportunities; and Dr. Pope was deſired to requeſt of the biſhop of **Exeter** [a] the communication of thoſe papers of Mr. **Rooke**, in which the obſervations of the ſame kind are ſtated.

Dr. **Goddard** produced a letter ſent to him from a domeſtic of Mr. **Buckland**, together with ſome potatoes, to be diſtributed amongſt the members of the ſociety or their friends, ſuch as had conveniency of planting them.

Sir **Robert Moray** communicated an account in Latin, of the diſſection made of the body of the lord **Belcarres**, in whoſe heart was found two ſtones. The paper was ordered to be regiſtered [b].

Occaſion being given to diſcourſe of the ſtar diſcovered by Dr. **Palmer**, archdeacon of Northampton, Sir **Robert Moray** moved, that a ſurvey might be made of the ſtars of the Zodiac by the beſt teleſcopes, for the diſcovery of new ſtars, and for rectifying the places of ſtars already known: for which purpoſe, Sir **Robert** offered himſelf to take his ſhare; Mr. **Balle** undertook the ſurvey of a whole ſign; and Mr. **Hooke** of as much as he could.

Mr. **Boyle** confirmed what was ſaid at the preceding meeting, about the volatile ſpirit extracted out of a ſponge, to be like the ſpirits drawn out of animal ſubſtances. And it being demanded, what difference he obſerved between animal and vegetable ſpirits, he ſaid that he had found, that the volatile ſpirits of animals poured upon acid ſpirits cauſed an effervеſcence, but thoſe of vegetables did not.

He offered, in caſe he could get any ſenſitive plants, to try how their ſpirits differed from thoſe of ordinary plants: and to make the like trial with muſhrooms.

Mr. **Hooke** was ordered not to fail of bringing in, at the next meeting, a liſt of experiments to be made in the new engine for the condenſation of the air.

April 22. Dr. **Goddard** was deſired to keep ſome of the vinegar with the little fiſhes in it well ſtopped, and ſome unſtopped, to ſee whether they would live in the one, and die in the other.

Mr. **Hooke** brought in two microſcopical obſervations, one of leeches in vinegar; the other of a bluiſh mould upon a mouldy piece of leather.

Mr. **Boyle** ſhewed a box, with figures carved on it very deep, done by an art of ſoftening wood, which the artiſt could harden again. He was deſired by the ſociety to let the artiſt know, how well they were pleaſed with this ſkill of his, and that they were willing to aſſiſt him in procuring a patent for him, in order that he might enjoy the benefit of his art, upon condition that he ſhould acquaint them with the ſecret.

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[a] Dr. **Seth Ward**.

[b] Original Regiſter, vol. ii. p. 217. This paper is publiſhed in Engliſh, in the Philoſophical Tranſactions, nº 5. p. 86, 87. July, 1665.

Dr. **Wren** was deſired to direct the operator for the making of the engine to ſet corn.

Mr. **Long** propoſed, that fiſhes of ſeveral kinds and ſeveral ages might be put into the pneumatical engine, to ſee which of them would die ſooneſt; he being perſuaded, that the youngeſt would die ſooneſt, and that roach, dace, and carp, would die ſooner than tench, eels, *&c.* The operator was ordered to provide ſeveral ſorts of fiſhes, and a more capacious glaſs, againſt the next meeting.

Sir **Robert Moray** deſiring, that it might be conſidered, which way was beſt to tranſport fiſh from one country to another; whether by the ſpawn, or by young fry, or by old fiſh? Mr. **Long** ſaid, that as to the ſpawn, he could give no account thereof; and as to the fry, he was of opinion, that the younger the fiſh was, the ſooner it would die, and the leſs it would be able to endure any hardſhip; but the older they were, the longer they would live, and the more hardſhip they would bear.

Sir **Robert Moray** mentioning, that fiſh being tranſported in veſſels from one place to another would hurt their noſes againſt the veſſel, and die ſoon after, Dr. **Wren** related, that a fiſh (of which Dr. **Wilkins** had the picture) had been taken alive, a part of the head and noſe of which was bitten off, and one eye wanting.

The obſervations made by Mr. **Rooke** of the ſatellites of Jupiter were ſaid to be delivered by the biſhop of **Exeter** to Dr. **Pope**, who was deſired, with Mr. **Hooke**, to continue them as they ſhould have opportunity.

Mr. **Long** acquainted the ſociety, that there were ermines in England, and that he would produce ſome before them. He mentioned alſo, that bay-ſalt being thrown upon toads would kill them. He was deſired to make the experiment with common ſalt, or any vegetable or mineral ſalt.

He made mention likewiſe of a kind of ſtones with natural ſcrews, and promiſed to ſhew ſome of them.

The lord viſcount **Brouncker**, Sir **Robert Moray**, Mr. **Balle**, Dr. **Wren**, Dr. **Pope**, Dr. **Croune**, and Mr. **Hooke**, were deſired to name, at the next meeting, ſome ſign, or part of a ſign, of the zodiac, which they would undertake to ſurvey.

The experiment of the not ſubſiding of water purged from air was ordered to be made at the next meeting: as alſo that of making the air extracted out of water return to water.

It was ordered, that Mr. **Boyle** ſhould be deſired to try, whether highly rectified ſpirit of wine, and camphire diſſolved therein, would burn away together, when lighted.

Mr. Lowther was elected.

Dr. Croune brought an account in writing of three experiments formerly recommended to him: 1. Of an egg put into wine, and incruſted with tartar. 2. Of wine transſuding through a ſtomach. 3. Of a carp fed in the air: the reading of which was deferred till the next meeting.

This day the ſecond charter, granted by the king to the Royal Society, paſſed the great ſeal in the following terms:

" Carolus ſecundus, Dei gratia Angliæ, Scotiæ, Franciæ, & Hiberniæ, rex,
" fidei defenſor, &c. omnibus, ad quos hæ literæ noſtræ patentes pervenerint,
" ſalutem. Diu multumque apud nos ſtatuimus, ut imperii fines, ſic etiam artes
" atque ſcientias ipſas promovere. Favemus itaque omnibus diſciplinis, particu-
" lari autem gratia indulgemus philoſophicis ſtudiis, præſertim iis, quæ ſolidis ex-
" perimentis conantur aut novam extundere philoſophiam, aut expolire veterem.
" Ut igitur inclareſcant apud noſtros hujuſmodi ſtudia, quæ nuſquam terrarum
" adhuc ſatis emicuerunt; utque nos tandem univerſus literarum orbis non ſolum
" fidei defenſorem, ſed etiam veritatis omnimodæ & cultorem ubique & patronum
" ſemper agnoſcat: Sciatis, quod nos de gratia noſtra ſpeciali ac ex certa ſcientia
" & mero motu noſtris ordinavimus conſtituimus & conceſſimus; ac per præſentes
" pro nobis heredibus & ſucceſſoribus noſtris ordinamus conſtituimus & concedi-
" mus, quod de cætero in perpetuum erit ſocietatis de præſide concilio & ſodalibus
" conſiſtens, qui vocabuntur & nuncupabuntur *Præſes Concilium & Sodales Rega-*
" *lis Societatis Londini pro ſcientia naturali promovenda* (cujus quidem ſocietatis
" nos ipſos fundatorem & patronum per præſentes declaramus) & eandem ſocie-
" tatem, per nomen Præſidis Concilii & Sodalium Regalis Societatis Londini
" pro ſcientia naturali promovenda, unum corpus corporatum & politicum in re
" facto & nomine realiter & ad plenum pro nobis heredibus & ſucceſſoribus noſtris
" facimus ordinamus creamus & conſtituimus per præſentes, & quod per idem no-
" men habeant ſucceſſionem perpetuam: Et quod ipſi & eorum ſucceſſores (quo-
" rum ſtudia ad rerum naturalium artiumque utilium ſcientias experimentorum
" fide ulterius promovendas in Dei Creatoris gloriam, & generis humani commo-
" dum applicanda ſunt) per idem nomen *Præſidis Concilii & Sodalium Regalis Socie-*
" *tatis Londini pro ſcientia naturali promovenda*, ſint & erunt perpetuis futuris tem-
" poribus perſonæ habiles & in lege capaces ad habendum perquirendum percipi-
" endum & poſſidendum terras tenementa prata paſcua paſturas libertates privilegia
" franchesias juriſdictiones & hereditamenta quæcunque ſibi & ſucceſſoribus ſuis in
" feodo & pepetuitate, vel pro termino vitæ vitarum vel annorum, ſeu aliter quo-
" cunque modo, ac etiam bona & catalla ac omnes alias res cujuſcunque fuerint
" generis naturæ ſpeciei ſive qualitatis (ſtatuto *De alienatione in manum mortuam*
" non obſtante) necnon ad dandum concedendum & aſſignandum eadem terras
" tenementa & hereditamenta bona & catalla, & omnia facta et res neceſſarias
" faciendum & exequendum de & concernentia eadem, per nomen prædictum:
" Et quod per nomen *Præſidis Concilii & Sodalium Regalis Societatis Londini pro*
" *ſcientia naturali promovenda* prædictum placitare & implacitari, reſpondere &
" reſponderi, defendere & defendi, de cætero in perpetuum valeant & poſſint, in

“ quibuſcunque curiis placeis & locis, & coram quibuſcunque judicibus & juſticiariis & aliis perſonis & officiariis noſtris heredum & ſucceſſorum noſtrorum, in omnibus & ſingulis actionibus, tum realibus tum perſonalibus, placitis ſectis querelis cauſis materiis rebus & demandis quibuſcunque, cujuſcunque ſint aut erunt generis naturæ vel ſpeciei, eiſdem modo & forma, prout aliqui ligei noſtri intra hoc regnum noſtrum Angliæ, perſonæ habiles & in lege capaces, aut ut aliquod corpus corporatum vel politicum intra hoc regnum noſtrum Angliæ, habere perquirere recipere poſſidere dare & concedere, placitare & implacitari, reſpondere & reſponderi, defendere & defendi, valeant & poſſint, valeat & poſſit: Et quod iidem præſes conſilium & ſodales Regalis Societatis prædictæ & ſucceſſores ſui habeant in perpetuum commune ſigillum, pro cauſis & negotiis ſuis & ſucceſſorum ſuorum quibuſcunque agendis deſerviturum; & quod bene liceat & licebit eiſdem præſidi concilio & ſodalibus Regalis Societatis prædictæ, & ſucceſſoribus ſuis pro tempore exiſtentibus, ſigillum illud de tempore in tempus frangere mutare & de novo facere, prout eis melius fore videbitur experiri. Damus inſuper & concedimus per præſentes præſidi concilio & ſodalibus Regalis Societatis prædictæ eorumque in perpetuum ſucceſſoribus, in favoris noſtri regii erga ipſos noſtræque de ipſis peculiaris exiſtimationis præſenti & futuris ætatibus teſtimonium, hæc honoris inſignia ſequentia, viz. In parmæ argenteæ angulo dextro tres leones noſtros Anglicos; & pro criſta galeam corona floſculis interſtincta adornatam, cui ſupereminet aquila nativi coloris, altero pede ſcutum leonibus noſtris inſignitum tenens; telamones ſcutarios, duos canes ſagaces albos, colla coronis cinctos (prout in margine luculentius videre eſt) a prædictis præſide concilio & ſodalibus ipſorumque ſucceſſoribus, prout feret occaſio, in perpetuum geſtanda producenda poſſidenda. Et, quod intentio noſtra regia meliorem ſortiatur effectum, ac pro bono regimine & gubernatione prædictæ Regalis Societatis de tempore in tempus, volumus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris concedimus eiſdem præſidi concilio concilio & ſodalibus Societatis Regalis prædictæ & ſucceſſoribus ſuis, quod de cætero in perpetuum concilium prædictum erit & conſiſtet ex viginti & una perſonis (quarum præſidem pro tempore exiſtentem, vel ejus deputatum, ſemper unum eſſe volumus) & quod omnes & ſingulæ aliæ perſonæ, quæ intra duos menſes proxime ſequentes poſt datum præſentium per præſidem & concilium, vel per aliquos undecem vel plures eorum (quorum præſidem pro tempore exiſtentem, vel ejus deputatum, ſemper unum eſſe volumus) vel per duas tertias partes vel plures prædictorum undecim vel plurium; & in omni tempore ſequenti per præſidem concilium & ſodales, ſive per aliquos viginti & unum vel plures eorum (quorum præſidem pro tempore exiſtentem, vel ejus deputatum, ſemper unum eſſe volumus) ſive per duas tertias partes vel plures prædictorum viginti & unius vel plurium; in eandem ſocietatem accipientur & admittentur ut membra Regalis Societatis prædictæ, & in regiſtro per ipſos conſervando annotatæ fuerint erunt vocabuntur & nuncupabuntur ſodales Regalis Societatis prædictæ, quamdiu vixerint, niſi ob cauſam aliquam rationabilem, ſecundum ſtatuta Regalis Societatis prædictæ condenda, quemvis eorum amoveri contigerit: quos quanto eminentius omnis generis doctrinæ bonarumque literarum ſtudio clareſcant, quanto ardentius hujuſce ſocietatis honorem ſtudia & emolumentum promoveri cupiant, quanto vitæ

“ integritatæ morumque probitate ac pietate emineant, & fidelitate animique erga nos coronam & dignitatem noſtram ſincero affectu polleant; eo magis idoneos & dignos, qui in ſodalium ejuſdem ſocietatis numerum adſeiſcantur, omnino cenſeri volumus. Et, pro meliori executione voluntatis & conceſſionis noſtræ in hac parte, aſſignavimus nominavimus conſtituimus & fecimus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris aſſignamus nominamus conſtituimus & facimus, prædilectum & fidelem nobis Willielmum vicecomitem Brouncker, cancellarium præchariſſimæ conſortis noſtræ reginæ Catharinæ, eſſe primum & modernum præſidem Regalis Societatis prædictæ; volentes quod prædictus Willielmus vicecomes Brouncker in officio præſidis Regalis Societatis prædictæ a datu præſentium uſque ad feſtum Sancti Andreæ proximum ſequentem [c] poſt datum præſentium continuabit, & quouſque unus alius de concilio Regalis Societatis prædictæ pro tempore exiſtente ad officium illud debito modo electus præfectus & juratus fuerit, juxta ordinationem & proviſionem in his præſentibus inferius expreſſam & declaratam (ſi prædictus Willielmus vicecomes Brouncker tam diu vixerit) ſacramento corporali in omnibus & per omnia officium illud tangentia bene & fideliter exequendum, ſecundum veram intentionem harum præſentium, coram prædilecto & perquam fideli conſanguineo & conſiliario noſtro Edwardo comite Clarendon cancellario noſtro prædicto ſacramentum prædictum adminiſtrare plenam poteſtatem & authoritatem damus & concedimus, in hæc verba ſequentia, viz. *I* William *viſcount* Brouncker *do promiſe to deal faithfully and honeſtly in all things belonging to the truſt committed to me, as preſident of the Royal Society of London for improving natural knowledge, during my employment in that capacity. So help me God.* Aſſignavimus etiam conſtituimus & fecimus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris facimus dilectos nobis & fideles Robertum Moray militem unum a ſecretoribus noſtris conciliis in regno noſtro Scotiæ, Robertum Boyle armigerum, Willielmum Brereton armigerum filium primogenitum baronis de Brereton, Kenelmum Digby militem præchariſſimæ matri noſtræ Mariæ reginæ cancellarium, Gilbertum Talbot militem jocalium noſtrorum theſaurarium, Paulum Neile militum unum oſtiariorum cameræ privatæ noſtræ, Henricum Slingesby armigerum unum generoſorum prædictæ privatæ cameræ noſtræ, Willielmum Petty militem, Timotheum Clarke in medicinis doctorem & unum medicorum noſtrorum, Johannem Wilkins in theologia doctorem, Georgium Ent in medicinis doctorem, Willielmum Aerskine unum a poculis noſtris, Jonathan Goddard in medicinis doctorem & profeſſorem Collegii de Greſham, Willielmum Balle armigerum, Matthæum Wren armigerum, Johannem Evelyn armigerum, Thomam Henshaw armigerum, Dudly Palmer de Grey's-Inn in comitatu noſtro Middleſexiæ armigerum, Abrahamum Hill de London armigerum, & Henricum Oldenburg armigerum, una cum præſide prædicto, fore & eſſe primos &c. modernos viginti & unum de concilio & ſodalibus Regalis Societatis prædictæ, continuandos in officiis concilii prædicti a datu præſentium uſque ad prædictum feſtum ſancti Andreæ apoſtoli proximum ſequentem, & deinde quouſque aliæ idoneæ perſonæ & habiles & ſufficientes in officia prædicta electæ præfectæ et juratæ fuerint

[c] *Sic in* Authent. *&* *aliquoties infra.*

“ (ſi tam diu vixerint, aut pro aliqua juſta & rationabili cauſa non amotæ[d] fuerint) ſacramentis corporalibus coram præſide pro tempore exiſtente prædictæ Regalis Societatis ad officia ſua bene & fideliter in omnibus & per omnia officia illa tangentia exequendum prius præſtandis, ſecundum formam & effectum prædicti ſacramenti, mutatis mutandis, præſidi Regalis Societatis prædictæ per cancellarium noſtrum Angliæ adminiſtrandi (cui quidem præſidi pro tempore exiſtenti ſacramenta prædicta adminiſtrare perſonis prædictis, & aliis quibuſcunque in poſterum de tempore in tempus in concilium prædictum eligendis, plenam poteſtatem & authoritatem pro nobis heredibus & ſucceſſoribus noſtris damus & concedimus per præſentes) & quod eædem perſonæ ſic, ut præfertur, ad concilium prædictæ Regalis Societatis electæ præfectæ & juratæ, & in poſterum eligendæ præficiendæ & jurandæ de tempore in tempus, erunt & exiſtent auxiliantes conſulentes & aſſiſtentes in omnibus materiis rebus & negotiis, meliores[e] regulationem gubernationem & directionem prædictæ Regalis Societatis, & cujuſlibet membri ejuſdem, tangentibus ſeu concernentibus. Concedimus etiam præſidi concilio & ſodalibus Societatis prædictæ & eorum in perpetuum ſucceſſoribus, quod ipſi & ſucceſſores eorum, ſeu aliqui novem vel plures eorum (quorum præſidem pro tempore exiſtentem, vel ejus deputatum, ſemper unum eſſe volumus) conventus ſeu congregationes de ſeipſis pro experimentorum & rerum naturalium cognitione & indagine aliiſque negotiis ad Societatem prædictam ſpectantibus, quoties & quando opus fuerit, licite facere & habere poſſint in collegio ſive aula ſive alio loco commodo intra civitatem noſtram Londini, vel in aliquo alio loco commodo intra decem milliaria ab eadem civitate noſtra. Et ulterius volumus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris concedimus præfatis præſidi concilio & ſodalibus Regalis Societatis prædictæ & ſucceſſoribus ſuis, quod præſes concilium & ſodales Regalis Societatis prædictæ pro tempore exiſtentes, ſive aliqui triginta & unus vel plures eorum (quorum præſidem pro tempore exiſtentem, vel ejus deputatum, unum eſſe volumus) ſeu major pars prædictorum triginta & unius vel plurium, de tempore in tempus perpetuis futuris temporibus poteſtatem & authoritatem habeant & habebunt nominandi & eligendi, & quod eligere & nominare poſſint & valeant, quolibet anno in prædicto feſto ſancti Andreæ, unum de concilio prædictæ Regalis Societatis pro tempore exiſtente, qui ſit & erit præſes Regalis Societatis prædictæ uſque ad feſtum ſancti Andreæ apoſtoli exinde proximum ſequentem (ſi tam diu vixerit, aut interim pro aliqua juſta & rationabili cauſa non amotus fuerit) & exinde, quouſque unus alius in officium præſidis Regalis Societatis prædictæ electus præfectus & nominatus fuerit; quodque ille poſtquam ſic, ut præfertur, electus & nominatus fuerit in officium præſidis Regalis Societatis prædictæ, antequam ad officium illud admittatur, ſacramentum corporale coram concilio ejuſdem Regalis Societatis, aut aliquibus ſeptem vel pluribus eorum, ad officium illud recte bene & fideliter in omnibus officium illud tangentibus exequendum præſtabit, ſecundum formam & effectum prædicti ſacramenti, mutatis mutandis cui quidem concilio, aut aliquibus ſeptem vel pluribus eorum, ſacramentum prædictum adminiſtrare pro nobis heredibus & ſucceſſoribus noſtris plenam poteſtatem & authoritatem de tempore in tempus, quotieſcunque præſi-

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[d] *Sic in* Authent.

[e] *Sic in* Authent.

" dem eligere opus fuerit, damus & concedimus per præſentes) & quod poſt hujuſmodi ſacramentum ſic, ut præfertur, præſtitum officium præſidis Regalis Societatis prædictæ uſque ad feſtum ſancti Andreæ apoſtoli exinde proximum ſequentem exequi valeat & poſſit: & ſi contigerit præſidem Regalis Societatis prædictæ pro tempore exiſtentem aliquo tempore, quamdiu fuerit in officio præſidis ejuſdem Regalis Societatis, obire, decedere, vel ab officio ſuo amoveri; quod tunc & toties bene liceat & licebit concilio Regalis Societatis prædictæ eorumque in perpetuum ſucceſſoribus, ſive aliquibus undecim vel pluribus eorum, convenire vel congregari ad eligendum unum de prædicto numero concilii prædicti in præſidem Regalis Societatis prædictæ; & quod ille, qui per concilium prædictum, vel per prædictos undecim vel plures, vel per majorem partem prædictorum undecim & plurium, electus fuerit & juratus, ut præfertur, officium illud habeat & exerceat durante reſiduo ejuſdem anni, & quouſque alius ad officium illud debito modo electus & juratus fuerit, ſacramento corporali in forma ſupra ſpecificata prius præſtando; & ſic toties quoties caſus ſic acciderit. Et ulterius volumus, quod quandocunque contigerit aliquem vel aliquos de concilio Regalis Societatis prædictæ pro tempore exiſtente mori, vel ab officio illo amoveri, vel decedere; quos quidem de concilio Regalis Societatis prædictæ & eorum quemlibet pro male ſe gerendis aut aliqua alia rationabili cauſa amobiles eſſe volumus, ad beneplacitum præſidis & cæterorum de concilio prædicto (quorum præſidem pro tempore exiſtentem, vel ejus deputatum, unum eſſe volumus) vel majoris partis eorundem: quod tunc & toties bene liceat & licebit præfatis præſidi concilio & ſodalibus Regalis Societatis prædictæ eorumque in perpetuum ſucceſſoribus, vel aliquibus viginti uni vel pluribus eorundem (quorum præſidem Regalis Societatis prædictæ pro tempore exiſtentem, vel ejus deputatum, unum eſſe volumus) vel majori parti prædictorum viginti & unius vel plurium, unum alium vel plures alios de ſodalibus Regalis Societatis prædictæ, loco ſive locis ipſius vel ipſorum ſic mortuorum decedentium vel amotorum, ad ſupplendum prædictum numerum viginti & unius perſonarum de concilio Regalis Societatis prædictæ nominare eligere & præficere: & quod ille ſive illi ſic in officio illo electi & præfecti idem officium habeat & habeant uſque ad feſtum ſancti Andreæ apoſtoli tunc proximum ſequentem, & exinde, quouſque unus alius vel plures alii electus præfectus & nominatus fuerit electi præfecti & nominati fuerint; ſacramento corporali ad officium illud in omnibus & per omnia officium illud tangentia coram præſide & concilio Regalis Societatis prædictæ, vel aliquibus ſeptem vel pluribus eorum (quorum præſidem pro tempore exiſtentem, vel ejus deputatum, ſemper unum eſſe volumus) bene & fideliter exequendum, ſecundum veram intentionem præſentium, prius præſtando. Et ulterius volumus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris concedimus præfatis præſidi concilio & ſodalibus prædictæ Regalis Societatis & ſucceſſoribus ſuis, quod ipſi & ſucceſſores ſui, ſive aliqui triginta & unus vel plures eorum (quorum præſidem pro tempore exiſtentem, vel ejus deputatum, ſemper unum eſſe volumus) ſive major pars prædictorum triginta & unius vel plurium quolibet anno, in prædicto ſeſto ſancti Andreæ apoſtoli, plenam poteſtatem & authoritatem habeant & habebunt eligendi nominandi præficiendi & mutandi decem de ſodalibus Regalis Societatis prædictæ, ad ſupplendum loca & officia decem prædicti numeri viginti & unius de concilio Regalis Societatis prædictæ; quoniam regiam

“ voluntatem noſtram eſſe declaramus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris concedimus, quod decem de concilio prædicto, & non amplius, per præſidem concilium & ſodales Regalis Societatis prædictæ annuatim mutati & amoti fuerint. Volumus etiam, & pro nobis heredibus & ſucceſſoribus noſtris concedimus præfatis præſidi concilio & ſodalibus prædictæ Regalis Societatis, & ſucceſſoribus ſuis in perpetuum, quod ſi contigerit præſidem ejuſdem Regalis Societatis pro tempore exiſtentem ægritudine vel infirmitate detineri, vel in ſervitio noſtro heredum vel ſucceſſorum noſtrorum verſari, vel aliter eſſe occupatum, ita quod neceſſariis negotiis ejuſdem Regalis Societatis officium præſidis tangentibus attendere non poterit; quod tunc & toties bene liceat & licebit eidem præſidi ſic detento verſato vel occupato unum de concilio prædictæ Regalis Societatis pro tempore exiſtente, fore & eſſe deputatum ejuſdem præſidis, nominare & appunctuare: qui quidem deputatus, in officio deputati præſidis prædicti ſic faciendus & conſtituendus, ſit & erit deputatus ejuſdem præſidis de tempore in tempus, toties quoties prædictus præſes ſic abeſſe contigerit, durante toto tempore, quo prædictus præſes in officio præſidis continuaverit; niſi interim prædictus præſes Regalis Societatis prædictæ pro tempore exiſtens unum alium de prædicto concilio ejus deputatum fecerit & conſtituerit: & quod quilibet hujuſmodi deputatus prædicti præſidis ſic, ut præfertur, faciendus & conſtituendus omnia & ſingula, quæ ad officium præſidis prædictæ Regalis Societatis pertinent ſeu pertinere debent, vel per prædictum præſidem virtute harum literarum noſtrarum patentium limitata & appunctuata fore[f] facienda & exquenda de tempore in tempus, toties quoties prædictus præſes ſic abeſſe contigerit, durante tali tempore, quo deputatus prædicti præſidis continuaverit, facere & exequi valeat & poſſit, vigore harum literarum noſtrarum patentium, adeo plene libere & integre, ac in tam amplis modo & forma, prout præſes prædictus, ſi præſens eſſet, illa facere & exequi valeret & poſſet; ſacramento corporali ſupra ſancta Dei evangelia in forma & effectu ſupra ſpecificatis per hujuſmodi deputatum ad omnia & ſingula, quæ ad officium præſidis pertinent, bene & fideliter exequendum, coram præfato concilio prædictæ Regalis Societatis, vel aliquibus ſeptem vel pluribus eorum, prius præſtando; & ſic toties quoties caſus ſic acciderit: cui quidem concilio, vel aliquibus ſeptem vel pluribus eorum pro tempore exiſtente[g], ſacramentum prædictum adminiſtrare poteſtatem & authoritatem, quoties caſus ſic acciderit, damus & concedimus per præſentes, abſque brevi commiſſione ſive ulteriori warranro in ea parte a nobis heredibus vel ſucceſſoribus noſtris procurando ſeu obtinendo. Et ulterius volumus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris concedimus præfatis præſidi concilio & ſodalibus Regalis Societatis prædictæ & ſucceſſoribus ſuis, quod ipſi & ſucceſſores ſui de cætero in perpetuum habeant & habebunt unum theſaurarium, duos ſecretarios, curatores experimentorum duos vel plures, clericum unum vel plures, & præterea duos ſervientes ad clavas qui de tempore in tempus ſuper præſidem attendant; quodque prædicti theſaurarius ſecretarii curatores clericus vel clerici & ſervientes ad clavas per præſidem concilium & ſodales Regalis Societatis prædictæ, ſive per aliquos triginta & unum vel plures eorum (quorum præſidem pro tempore exiſtentem, vel ejus deputa-

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[f] *Sic in Authent.*

[g] *Sic in Authent.*

“ tum, unum eſſe volumus) vel per majorem partem prædictorum triginta &
“ unius vel plurium, eligendi & nominandi, antequam ad officia ſua ſpeciali &
“ reſpectiva exequendum admittantur, ſacramenta ſua corporalia in forma &
“ effectu ſupra ſpecificatis, coram præſide vel ejus deputato, & concilio ejuſdem
“ Regalis Societatis, aut aliquibus ſeptem vel pluribus eorum, officia ſua ſeparalia
“ & reſpectiva in omnibus illa tangentibus recte bene & fideliter exequendum
“ præſtabunt; & quod poſt hujuſmodi ſacramenta ſic, ut præfertur, præſtita offi-
“ cia ſua reſpectiva exerceant & utantur: quibus quidem præſidi & concilio, aut
“ aliquibus ſeptem vel pluribus eorum, ſacramenta prædicta de tempore in tem-
“ pus adminiſtrare prædictis ſeparalibus & reſpectivis officiariis & ſucceſſoribus
“ ſuis plenam poteſtatem & authoritatem damus & concedimus per præſentes: &
“ aſſignavimus nominavimus elegimus creavimus conſtituimus & fecimus, ac per
“ præſentes pro nobis heredibus & ſucceſſoribus noſtris aſſignamus nominamus
“ eligimus creamus conſtituimus & facimus, dilectos ſubditos noſtros prædictum
“ WILLIELMUM BALLE armigerum fore & eſſe primum & modernum theſaura-
“ rium, & prædictum[b] JOHANNEM WILKINS & HENRICUM OLDENBURG fore
“ & eſſe primos & modernos ſecretarios prædictæ Regalis Societatis, continuandos
“ in eiſdem officiis uſque ad prædictum feſtum ſancti Andreæ apuſtoli proximum
“ ſequentem poſt datum præſentium: quodque de tempore in tempus & ad
“ omnia tempora in prædicto feſto ſancti Andreæ apoſtoli (ſi non fuerit dies
“ dominicus, & ſi fuerit dies dominicus, tunc die proximo ſequente) præſes
“ concilium & ſodales prædictæ Regalis Societatis pro tempore exiſtentes, ſive
“ aliqui triginta & unus vel plures eorum (quorum præſidem pro tempore exiſt-
“ entem, vel ejus deputatum, unum eſſe volumus) ſive major pars prædictorum
“ triginta & unius vel plurium, probos & diſcretos viros de tempore in tempus in
“ theſaurarium & ſecretarios, qui ſunt & erunt de numero concilii Regalis Socie-
“ tatis prædictæ, eligere nominare & præficere valeant & poſſint; quodque illi,
“ qui in ſeparalia & reſpectiva officia prædicta ſic, ut præfertur, electi præfecti &
“ jurati fuerint, officia illa reſpectiva exercere & gaudere poſſint & valeant uſque
“ ad prædictum feſtum ſancti Andreæ extunc proximum ſequentem, ſacramentis
“ ſuis prædictis ſic, ut præfertur, prius præſtandis; & ſic toties quoties caſus ſic
“ acciderit: Et ſi contigerit electiones prædictas præſidis concilii theſaurarii ſecre-
“ tariorum, vel alicujus vel aliquorum eorum, in feſto ſancti Andreæ prædicto
“ commode fieri vel perfici non poſſe, damus & concedimus prædictis præſidi
“ concilio & ſodalibus, & ſucceſſoribus eorum in perpetuum, quod ipſi, vel aliqui
“ triginta & unus vel plures eorum (quorum præſidem pro tempore exiſtentem,
“ vel ejus deputatum, unum eſſe volumus) vel major pars prædictorum triginta &
“ unius vel plurium, licite poſſint nominare & aſſignare unum alium diem, quam
“ proxime ad feſtum ſancti Andreæ prædictum commodé fieri poterit, pro electi-
“ onibus prædictis faciendis vel perficiendis; & ſic de die in diem, donec præ-
“ dictæ electiones perficiantur: Et ſi contigerit aliquem vel aliquos officiariorum
“ prædictorum ejuſdem Regalis Societatis obire, decedere, vel ab officiis ſuis re-
“ ſpectivis amoveri; quod tunc & toties bene liceat & licebit præſidi concilio &
“ ſodalibus prædictæ Regalis Societatis, & eorum ſucceſſoribus in perpetuum, ſive
“ aliquibus viginti & uni vel pluribus eorum (quorum præſidem pro tempore ex-

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[b] *Sic in Authent.*

“ iſtentem, vel ejus deputatum, unum eſſe volumus) ſeu majori parti prædictorum viginti & unius vel plurium, alium vel alios in officium ſive officia illarum perſonarum ſic defunctarum decedentium ſive amotarum eligere & præficere; & quod ille ſive illi ſic electus & præfectus electi & præfecti officia prædicta reſpectiva habeant & exerceant durante reſiduo ejuſdem anni, & quouſque alius ſive alii ad officia illa reſpectiva debito modo electus & juratus fuerit electi & jurati fuerint; & ſic toties quoties caſus ſic acciderit. Et inſuper volumus, ac de gratia noſtra ſpeciali ac ex certa ſcientia & mero motu noſtris concedimus præfatis præſidi concilio & ſodalibus Regalis Societatis prædictæ, & ſucceſſoribus ſuis in perpetuum, quod præſes & concilium prædictæ Regalis Societatis pro tempore exiſtentes præmiſſa ſemper in conventibus extraordinariis omnium membrorum concilii prædicti debita ſeu legitima ſummonitione vel citatione) ſive aliqui novem vel plures eorum (quorum præſidem pro tempore exiſtentem, vel ejus deputatum, unum eſſe volumus) pariter congregare & aſſemblare poſſint & valeant in collegio ſive aula ſive alio loco, conveniente intra civitatem noſtram Londini, vel in aliquo alio loco conveniente intra decem milliaria ab eadem civitate noſtra; & quod ipſi ſic congregati & aſſemblati, ſive major pars eorum, habebunt & habeant plenam authoritatem poteſtatem & facultatem de tempore in tempus condendi conſtituendi ordinandi faciendi & ſtabiliendi hujuſmodi leges ſtatuta jura ordinationes & conſtitutiones, quæ eis, aut eorum majori parti, bona ſalubria utilia honeſta & neceſſaria juxta eorum ſanas diſcretiones fore videbuntur, pro meliori gubernatione regulatione & directione Regalis Societatis prædictæ & cujuſlibet membri ejuſdem, omniaque ad gubernationem res bona facultates redditus terras tenementa hereditamenta & negotia Regalis Societatis prædictæ ſpectantia agendi & faciendi; quæ omnia & ſingula leges ſtatuta jura ordinationes & conſtitutiones ſic, ut præfertur, facienda volumus, & per præſentes pro nobis heredibus & ſucceſſoribus noſtris firmiter injungendo præcipimus & mandamus, quod de tempore in tempus inviolabiliter obſervata fuerint, ſecundum tenorem & effectum eorundem: ita tamen, quod prædictæ leges ſtatuta jura ordinationes & conſtitutiones ſic, ut præfertur, facienda, & eorum quælibet, ſint rationabilia, & non ſint repugnantia nec contraria legibus conſuetudinibus juribus ſive ſtatutis hujus regni noſtri Angliæ. Et ulterius de ampliori gratia noſtra ſpeciali ac ex certa ſcientia & mero motu noſtris dedimus & conceſſimus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris damus & concedimus, præfatis præſidi concilio & ſodalibus prædictæ Regalis Societatis, & ſucceſſoribus ſuis in perpetuum, ſive aliquibus viginti & uni vel pluribus eorum (quorum præſidem pro tempore exiſtentem, vel ejus deputatum, ſemper unum eſſe volumus) ſeu majori parti prædictorum viginti & unius vel plurium, plenam poteſtatem & authoritatem de tempore in tempus eligendi nominandi & conſtituendi unum vel plures typographos ſive impreſſores, & chalcographos ſeu ſculptores, & ipſi vel ipſis per ſcriptum communi ſigillo prædictæ Regalis Societatis ſigillatum, & manu præſidis pro tempore exiſtentis ſignatum, facultatem concedendi, ut imprimant tales res materias & negotia prædictam Regalem Societatem tangentia vel concernentia, quales prædicto typographo vel impreſſori, chalcographo ſeu ſculptori, vel typographis vel impreſſoribus, chalcographis vel ſculptoribus, de tempore in tempus per præſidem & concilium prædictæ Regalis Societatis, vel aliquos ſeptem vel plures eorum (quorum præſidem pro tem-

“ pore exiſtentem, vel ejus deputatem, unum eſſe volumus) vel per majorem partem prædictorum ſeptem vel plurium, commiſſæ fuerint; ſacramentis ſuis corporalibus, antequam ad officia ſua exercenda admittantur, coram præſide & concilio pro tempore exiſtente, vel aliquibus ſeptem vel pluribus eorum, in forma & effectu ultimis[i] ſpecificatis, prius præſtandis; quibus quidem præſidi & concilio, vel aliquibus ſeptem vel pluribus eorum, ſacramenta prædicta adminiſtrare plenam poteſtatem & authoritatem damus & concedimus per præſentes. Et ulterius, quod prædicti præſes concilium & ſodales prædictæ Regalis Societatis in philoſophicis ſuis ſtudiis meliorem ſortiantur effectum, de ampliori gratia noſtra ſpeciali ac ex certa ſcientia & mero motu noſtris dedimus & conceſſimus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris damus & concedimus, prædictis præſidi concilio & ſodalibus prædictæ Regalis Societatis, & ſucceſſoribus ſuis in perpetuum, quod ipſi & ſucceſſores ſui, ſive aliqui novem vel plures eorum (quorum præſidem pro tempore exiſtentem, vel ejus deputatum, unum eſſe volumus) ſive major pars prædictorum novem vel plurium, de tempore in tempus, habeant & habebunt plenam poteſtatem & authoritatem de tempore in tempus, & ad talia tempeſtiva tempora, ſecundum eorum diſcretionem, per aſſignatum vel aſſignatos ſuos requirere capere & recipere cadavera talium perſonarum, quæ mortem manu carnificis paſſæ fuerunt, & ea anatomizare, in tam amplis modo & forma, & ad omnes intentiones & propoſita, prout præſidens Collegii Medicorum & Societatis Chirurgorum civitatis noſtræ London (quibuſcunque nominibus duæ prædictæ corporationes inſignitæ fuerint) eiſdem cadaveribus uſi vel gaviſi fuerunt, aut uti vel gaudere valeant & poſſint. Et ulterius, pro melioratione experimentorum artium & ſcientiarum prædictæ Regalis Societatis, de abundantiori gratia noſtra ſpeciali ac ex certa ſcientia & mero motu noſtris dedimus & conceſſimus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris damus & concedimus, præfatis præſidi concilio & ſodalibus prædictæ Regalis Societatis, & ſucceſſoribus ſuis in perpetuum, quod ipſi & ſucceſſores ſui, ſive aliqui novem vel plures eorum quorum præſidem pro tempore exiſtentem, vel ejus deputatum, unum eſſe volumus) ſive major pars prædictorum novem vel plurium, de tempore in tempus habeant & habebunt plenam poteſtatem & authoritatem per literas vel epiſtolas, ſub manu prædicti præſidis vel ejus deputati, in præſentia concilii vel aliquorum ſeptem vel plurium eorum, & in nomine Regalis Societatis, mutuis intelligentiis fruentur[k] & negotiis cum omnibus & omnimodis peregrinis & alienis, utrum privatis vel collegiatis, corporatis vel politicis, abſque aliqua moleſtatione interruptione vel inquietate[l] quacunque: proviſo tamen, quod hæc indulgentia noſtra ſic, ut præfertur, conceſſa ad ulteriorem non extendatur uſum, quam particulare beneficium & intereſſe prædictæ Regalis Societatis in materiis ſeu rebus philoſophicis mathematicis aut mechanicis. Et ulterius dedimus & conceſſimus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris damus & concedimus, præfatis præſidi concilio & ſodalibus Regalis Societatis prædictæ, & ſucceſſoribus ſuis in perpetuum, ſive præſidi & concilio Regalis Societatis prædictæ, vel majori parti eorum, plenam poteſtatem & authoritatem erigendi ædificandi & extruendi, aut erigi ædificari & extrui faciendi vel cauſandi, intra civitatem noſtram Londini,

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[i] *Sic in* Authent.

[k] *Sic in* Authent.

[l] *Sic in* Authent.

“ vel decem milliaria ab eadem, unum vel plura collegium vel collegia cujuſcun-
“ que modi & qualitatis, pro habitatione aſſemblatione & congregatione prædicto-
“ rum præſidis concilii & ſodalium prædictæ Regalis Societatis & ſucceſſorum
“ ſuorum, ad negotia ſua & alias res eandem Regalem Societatem concernentes
“ ordinandum & diſponendum. Et ulterius volumus, ac per præſentes pro no-
“ bis heredibus & ſucceſſoribus noſtris ordinamus conſtituimus & appunctuamus,
“ quod ſi aliqui abuſus vel diſcrepantiæ in poſterum oriantur & accident de guber-
“ natione aut aliis rebus vel negotiis prædictæ Regalis Societatis, unde ejuſdem
“ conſtitutioni ſtabilimini & ſtudiorum progreſſui vel rebus & negotiis aliqua in-
“ feratur injuria vel impedimentum; quod tunc & toties per præſentes pro nobis
“ heredibus & ſucceſſoribus noſtris authorizamus nominamus aſſignamus & con-
“ ſtituimus præfatum prædilectum & perquam fidelem conſanguineum & conſi-
“ liarium noſtrum EDWARDUM comitem de CLARENDON cancellarium noſtrum
“ regni noſtri Angliæ, per ſeipſum durante vita ſua, & poſt ejus mortem tunc
“ archiepiſcopum Cantuarienſem, cancellarium vel cuſtodem magni ſigilli Angliæ,
“ theſaurarium Angliæ, cuſtodem privati ſigilli, epiſcopum Londinenſem, & duos
“ principales ſecretarios pro tempore exiſtentes, aut aliquos quatuor vel plures
“ eorum, eaſdem diſcrepantias & abuſus reconciliare componere & reducere. Et
“ ulterius volumus, ac per præſentes pro nobis heredibus & ſucceſſoribus noſtris
“ firmiter injungendo præcipimus & mandamus omnibus & ſingulis juſtitiariis,
“ majoribus, aldermannis, vicecomitibus, balivis, conſtabulariis, & aliis officiariis
“ miniſtris & ſubditis noſtris heredum & ſucceſſorum noſtrorum quibuſcunque,
“ quod de tempore in tempus ſint auxiliantes & aſſiſtentes prædictis præſidi con-
“ cilio & ſodalibus Regalis Societatis prædictæ, eorumque in perpetuum ſucceſſo-
“ ribus, in omnibus & per omnia, ſecundum veram intentionem harum literarum
“ noſtrarum patentium. Eo, quod expreſſa mentio de vero valore annuo, vel de
“ certitudine præmiſſorum ſive eorum alicujus, aut de aliis donis ſive conceſſioni-
“ bus per nos ſeu per aliquem progenitorum ſive prædeceſſorum noſtrorum præ-
“ fatis præſidi concilio & ſodalibus Regalis Societatis prædictæ ante hæc tempora
“ factis, in præſentibus minime facta exiſtit, aut aliquo ſtatuto actu ordinatione
“ proviſione proclamatione ſive reſtrictione in contrarium inde antehac habitis
“ factis editis ordinatis ſive proviſis, aut aliqua alia re cauſa vel materia quacun-
“ que, in aliquo non obſtante, In cujus rei teſtimonium has literas noſtras fieri
“ fecimus patentes. Teſte me ipſo apud Weſtmonaſterium, viceſimo ſecundo die
“ Aprilis, anno regni noſtri decimo quinto.

“ Per breve de privato ſigillo.

“ HOWARD.”

April 29. Mr. LOUTHER and Mr. SPRAT were admitted.

Dr. WREN ſhewed his model of the theatre to be built at Oxford for the Univerſity acts, and upon occaſion for plays; and was deſired to give in writing a ſcheme and deſcription of the whole frame of it, to remain as a memorial among the archives of the ſociety.

Mr. Long gave ſome account of the generation of ants, how they come out of the pods full of eggs, which receive immediately the male, and then become ants: and it was obſerved, that they were maggots, that come out of the pods, ſince they appear in the microſcope to move and gape.

He remarked, that he had ſeen the maggot under a ſtag's tongue.

He made alſo the experiment of killing water-newts with bay-ſalt, wormwood-ſalt, and *ſal prunellæ*; the firſt killing them more ſlowly than the two other. They being put into freſh water, did not recover.

He mentioned, that the land-newts are more noxious than the water-newts; and that toads, though they are not venemous in the cool and moiſt ſeaſon of the ſpring, yet are ſo in the heat of the ſummer, eſpecially in Italy and ſuch like hot countries. He added, that a toad in the height of ſummer being broken, infects and poiſons with its very ſteam.

The experiment with bay-ſalt, &c. was ordered to be made upon toads, both male and female; and the operator was directed to provide ſome of them againſt the next meeting.

Dr. Croune affirmed, that he had ſeen a true viper with a young live one in its belly.

Mr. Long mentioned, that the female viper hath four teeth, two above and two below; but the male only two, and thoſe above.

Dr. Goddard's glaſs with ſtale vinegar was produced, which had been kept cloſe ſtopped with a cork for five or ſix days; whereby moſt of the little leeches ſwimming therein were killed, appearing now ſtretched out in length, and ſo floating and moved up and down, but not moving themſelves, or wriggling as they do when alive.

Mr. Boyle was deſired to communicate his papers concerning the manner, in which his father, the earl of Corke, had carps tranſported into Ireland, where they were not before.

Sir Robert Moray mentioning a way uſed in Scotland for producing fiſh, where they were not, by tranſporting of ſpawn, was deſired to make a full inquiry after it, and to communicate it to the ſociety; which he promiſed to do.

Mr. Hooke produced two microſcopical obſervations, one of a mine of diamonds uſual in flints; the other a ſpider appearing to have ſix eyes: but this latter was not yet perfectly drawn.

The *virgula divina* was ordered to be tried at the next meeting, Mr Boyle and Mr. Brereton affirming to have ſeen it ſucceed in the hands of others, though theirs were not ſo lucky as to have that effect performed by them. The operator was ordered to deſire the apparatus from Mr. Brereton, to be tried both by the naked hand, and after the way practiſed by Gabriel Platt, printed in his treatiſe, intituled, *A Diſcovery of ſubterraneal treaſures*[m], p. 12.

Mr. Boyle was again deſired to ſpeak with the artiſt about the method of ſoftening wood, and hardening it again.

Sir Robert Moray related, that an old watch, when to be mended, was found to have the ſteel ſo hard, that it could not be filed, either before it was heated, or after it was cooled again, but only whilſt it was red hot.

Mr. Long mentioned to have ſeen a breaſt piece ſo tough, that it could not be pierced by a piſtol-bullet, but was only indented.

Col. Tuke was deſired to take an occaſion to ſpeak with his highneſs prince Rupert, concerning the way of tempering ſteel to that toughneſs, that it will not eaſily be pierced; and to ſee whether he would pleaſe to diſcover it in favour to the ſociety.

Dr. Croune's three experiments, brought in at the laſt meeting, were read, and ordered to be regiſtered[n], as follows:

“ EXPERIMENT 1.

“ An egg being put into half a pint of Champagne wine, firſt a great number ſmall bubbles roſe up to the ſurface of the wine, and there remained in the exact figure of the egg. Then being left in twenty-four hours, there was a hard tartarous matter adhered to the ſhell, of a ſad rediſh colour. This egg was taken out, and another put in, and after that another, to the number of five, all which had a quantity of the ſame matter cruſted about the ſhell; but the latter leſs than the former, and the wine in about a week's time loſt its colour, ſtanding open in the air in a broad glaſs, and looked like ſtrong-beer in the glaſs.

“ Another ſingle egg being left in the like quantity of the ſame ſort of wine a week, the ſhell was corroded by the liquor in ſeveral places, which did not happen before.

“ EXPERIMENT 2.

“ There were put into the ventricle taken out of a perſon executed about five pints of French wine, of which in three days time a pint and an half tranſuded through the pores. In the ſame manner it paſſed through that gut, which is commonly called the *duodenum*, but through the *ileum* in a much ſhorter time. It brought with it through the pores of the *duodenum* much of the mucus, that lines that gut.

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[m] Printed at London in 1639, in 4to.

[n] Original Regiſter, vol. ii. p. 218.

"EXPERIMENT 3.

"A carp being hung up in filliting, ſo fitted that it might conveniently ſwal-
"low, and ſack and bread being given it, put with a little ſpoon into the mouth,
"it would not (as far as could be diſcovered) ſwallow it, and after four or five
"hours time died. This trial was made in Dr. GODDARD's cellar."

Dr. CROUNE was deſired to try the experiment of tranſudation upon the ventricle of a live dog, and to repeat that of the carp with as much care as poſſible; and that of the egg with ſmall pieces of an egg-ſhell put into a glaſs with wine luted up.

Mr. BOYLE mentioned, that he had tried the experiment of the egg in ſack, and found it alſo incruſted with tartarous matter.

It was queried, whether this was done by precipitation or corroſion.

Dr. CROUNE was deſired to give an account in writing of the bladder of the tench killed in the engine; which bladder, he ſaid, was found flat, but expanded itſelf again, when put into the engine, upon the exhauſting of the air.

Dr. WREN was deſired to acquaint Mr. HOOKE with the apparatus and progreſs, which he had made in the experiment of hatching eggs by the equal and moderate heat of a lamp, in order to proſecute the experiment, which was ſaid to have been ſo far advanced, as that thereby blood was produced in eggs.

In the ſurvey of the zodiac the lord viſcount BROUNCKER and Sir ROBERT MORAY aſſigned to themſelves Sagittarius; Mr. BALLE Libra; Dr. POPE and Dr. CROUNE Aries; Dr. WREN and Mr. HOOKE Taurus.

Mr. BOYLE was deſired to try, whether highly rectified ſpirit of wine and camphire diſſolved in it will flame away together.

May 6. Mr. BOYLE made the experiment of ſpirit of wine highly rectified and camphire diſſolved in it, which burnt all away, the flame being on the top whitiſh and blue beneath.

He made likewiſe an experiment of a body ſwimming in water, and by the addition of more water ſinking to the bottom, and by the diminution thereof ſwimming again. The body ſwimming was a little glaſs bubble open at one end, and containing a bubble of air with water. The veſſel, in which this was exhibited, was a pipe of five or ſix feet long. And the like phænomenon followed on the blowing in of air, and drawing it out again. Mr. BOYLE being deſired to bring in a full account of this in writing, declared his intention of publiſhing it in a treatiſe of his to be printed.

Mr. AUBREY mentioned, that holly-berries, after they have lain five or ſix hours at the bottom of a veſſel with water, will riſe and ſwim in the middle thereof:

which was thought to be cauſed by a kind of fermentation and ſwelling, and thereby taking up more ſpace. The experiment was ordered to be tried in winter.

He ſuggeſted, that grains of wheat, if good and ſound, will ſink in water, and by ſinking get a bubble of air ſticking to them; and after ſome time riſe again, the bubble breaking, and then ſink the ſecond time to the bottom, but never riſe again. This he ſaid he had tried with all other ſorts of grain, except rye, but none of them did the like.

The *virgula divina* was tried, but by unlucky hands. It was ordered to be tried again with ſhoots of one year's growth, and after GABRIEL PLATT's method, tying the end of the hazel to a ſtaff in the middle with a ſtrong thread, ſo that it hang even, like the beam of a balance.

A toad and ſlow worm were killed by throwing ſalt of tartar and common ſalt upon them.

Mr. HOOK exhibited a microſcopical obſervation of a female gnat, diſtinguiſhed from the male by the bigneſs of her belly; that of the male being thin and lank, the male having alſo a tuft.

He being aſked, whether he had received from Dr. WREN an account of the way of hatching eggs by a lamp, anſwered, that he had received it in good part; and that the doctor had promiſed to communicate the reſt to him.

Monſieur DE LA QUINTINYE's letter was read, excuſing his not communicating for the preſent his diſcourſe and experiments of the culture of trees, and promiſing to continue his labors upon that ſubject; and intimating his inclination, after more advancement in it, to publiſh it.

Mr. BEAL's offer of ſending to the ſociety ſome hortulane diſcourſes in manuſcript of Dr. JUNGIUS, and CALEB MORLEY's mnemonical ſcrolls, together with his explication, was accepted of.

Sir ROBERT MORAY mentioned, that the earl of SANDWICH had aſſured him, that at the depth of ſixty fathom water, ſix men could pull up an anchor; which, when it came near the ſurface, ten men could ſcarce do.

Sir ROBERT moved, that it might be tried, whether bodies would vary in their weight, being ſunk under water, as they will do, being let down into deep mine-pits, according to Dr. POWER's experiment, wherein a braſs-lamp, that was of an exact pound weight at the top of the pit, weighed at the bottom thereof, being ſixty-eight yards diſtant from the the top, lighter by an ounce at leaſt.

Mr. HOOKE was ordered to bring in ſome experiments upon every head of thoſe queries, which he brought in writing at this meeting, concerning the condenſation of air, in order to make them in the compreſſing engine. The ſaid queries were ordered to be entered*, and were as follow:

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* Original Regiſter, vol. ii. p. 219.

1. "To what degree the air may by this means be condenſed?

2. "What ſtrength is requiſite to condenſe it into ſeveral degrees?

3. "What bodies will ſuffer a condenſation? as what liquors, whether water, "quickſilver, oil, ſpirit of wine, &c. What ſolid bodies? as metals, glaſs, "ſtones, &c.

4. "With what force it will be able to ſhoot a ſolid body? as a bullet; or a "fluid? as water, &c.

5. "What bodies the air, or other liquors may be forced into or through? as "whether through lead, tin, iron, braſs, box, ivory, &c. Whether the air may "be forced into liquors? as water, wine, &c.

6. "How much heavier the condenſed air will be; or how much the weight "of a light bulky body will be altered? as whether it may be made heavy enough "to make a feather, the pith of elder, cork, or the like, ſwim or float at the top "of the air.

7. "Whether ſome fluid bodies will not grow ſolid and fixed, whilſt they remain "under a preſſure?

8. "Whether the congruity and incongruity of ſome bodies will not be changed? "that is, whether ſome liquors, that were before congruous and mixt, will not "prove incongruous and ſeparate from each other? and the contrary.

9. "Whether there will be any variation in the riſing of liquors in ſmall pipes? "and whether filtration would be hindred or promoted?

10. "What variation there will be found in the refraction of the rays of light?

11. "Whether the air may not grow thicker? that is more opacous.

12. "What variation there will be found, as to heat and cold?

13. "Whether fire will laſt much longer, or be ſooner extinguiſhed?

14. "Whether the ſmoak will at all deſcend, or not rather float at the top like "a cloud?

15. "What hindrance bodies will ſuffer in their motions through it? as how "much ſlower a pendulum will vibrate, &c.

16. "What animals will live in it, and what die?

"How thoſe that live endure it? whether pleaſantly or with regret: if it ſeem "painful to them and offenſive? whether it make them nimble and acute, or "dull and ſleepy, &c.

" Whether fiſhes will live in water under a preſſure? what they are, and how " they endure it?

" Whether with preſſure they will grow heavy and ſink to the bottom of the " veſſel? whether ſeveral bodies, that will ſwim in water in open air, will not ſink " by the increaſe of preſſure?"

May 13 The council of the ſociety met for the firſt time this day[a], there being preſent the following perſons:

The lord viſcount Brouncker.
Sir Robert Moray.
Mr. Robert Boyle.
Sir Gilbert Talbot.
Mr William Aerskine.
Mr Henry Slingsby.
Dr. John Wilkins.
Dr. George Ent.
Dr. Jonathan Goddard.
Dr. Timothy Clarke.
Dr. William Balle.
Mr. John Evelyn.
Mr. Dudley Palmer.
M. Abraham Hill.
Mr. Henry Oldenburg.

The new charter of the ſociety was read before them, wherein the members of the council were nominated, as follows:

The lord viſcount Brouncker, preſident.
Sir Robert Moray.
Robert Boyle, eſq;
William Brereton, eſq;
Sir Kenelme Digby.
Sir Paul Neile.
Sir Gilbert Talbot.
Henry Slingesby, eſq;
Sir William Petty, eſq;
Timothy Clarke, M. D.
William Aerskine, eſq;
John Wilkins, D. D. Secretary.
George Ent, M. D.
Jonathan Goddard, M. D.
William Balle, eſq; Treaſurer.
Matthew Wren, eſq;
John Evelyn, eſq;
Thomas Henshaw, eſq;
Dudley Palmer, eſq;
Abraham Hill, eſq;
Henry Oldenburg, eſq; Secretary.

The members of the council preſent were ſworn by the preſident; and Mr. Balle was alſo ſworn as treaſurer, and Dr. Wilkins and Mr. Oldenburg as ſecretaries.

Mr. Wicks was ſworn as clerk.

It was ordered, that the debate concerning thoſe, who were to be received and admitted into the ſociety, be kept under ſecrecy: And

That all thoſe, who had met hitherto as fellows of the Royal Society on Wedneſdays in the afternoon, ſhall be admitted to ſit with the preſent fellows of the ſociety till farther order.

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[a] Council-book of the Royal Society, vol. i.

The collecting of arrears being thought neceſſary, the following order was drawn up concerning the ſame:

" Wedneſday May 13, 1663.

" At a meeting of the council of the Royal Society.

" Ordered, that all perſons, that have been elected or admitted into the Royal " Society, do pay their whole arrears unto this day, according to their ſubſcription: " and that the treaſurer, or collector by him appointed, do repair to every ſuch " perſon, and demand the ſaid arrears, ſhewing unto him this order, together " with the form of the ſubſcription hereunto annexed.

Signed by the Preſident.

The form of the Subſcription.

" We, whoſe names are under-written, do conſent and agree, that we will meet " together weekly (if not hindered by neceſſary occaſions) to conſult and debate " concerning the promoting of experimental learning: and that each of us will " allow one ſhilling weekly towards the defraying of occaſional charges: provided, " that if any one, or more of us, ſhall think fit at any time to withdray, he or " they ſhall, after notice thereof given to the company at a meeting, be freed from " this obligation for the future."

It was ordered, that a ſhort extract be made by Dr. GODDARD of the heads of the charter for the uſe of the council.

At a meeting of the SOCIETY on the ſame day [a],

The operator was charged to provide frogs and toads againſt the next meeting, and ſome pitch and tar, to be put upon their backs, according to Mr. HENSHAW's ſuggeſtion.

The earl of KINCAIRDIN was deſired to try in his coal pits in Scotland thoſe ſubterraneous experiments formerly ſuggeſted by Sir ROBERT MORAY, and in part tried by Dr. POWER.

Sir JAMES SHAEN was deſired to take care, that Engliſh earth and toads be ſent over into Ireland, and to recommend it to the members of the ſociety there to try, whether toads do preſently dry upon Iriſh earth: as alſo to have ſome Iriſh earth and wood tranſported into England, to examine what is in them peculiar.

It was ordered, that the lord viſcount MASSAREENE be deſired to inform the ſociety concerning the tranſmutation of holly into iron, as far as it is ſtuck into the ground under the water of a lough, called [b], and into ſtone as far as it ſtands in that water, remaining wood as far as it is extant above the water.

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[a] Monſieur DE MONCONYS, who was preſent at this meeting, gives ſome account of what paſſed there in his *Voyage d'Angleterre*, p. 45, *& ſeqq.* Edit. Paris, 1695.

[b] The name is wanting in the journal: but Monſieur DE MONCONYS ſays, p. 46, that it was called *Erno*.

Mr. HENSHAW related, that an artiſt in Italy had hardened tools of ſteel in *branca urſina*, in order to make them cut porphyry.

The operator was ordered to try Mr. AUBREY's experiment of ſinking wheat into common water; and to obſerve, whether, after two or three days, it ſwims again.

The lord viſcount KINCARDIN confirmed Sir ROBERT MORAY's relation of the way of breeding fiſh by tranſporting ſpawn, and was deſired to inform the ſociety of the whole manner thereof, how, and in what ſeaſon the ſpawn muſt be gathered, how managed, and in what ſort of fiſhes it hath been practiſed.

The operator was ordered to provide ſome fiſhes full of ſpawn, as perches, flounders, and gudgeons; and to put them into a great glaſs of water, to obſerve the ſpawn when caſt.

The lord viſcount BROUNCKER undertook to put ſome fiſhes big with ſpawn into his ciſtern at Whitehall, in order to obſerve the ſpawn.

Mr. HENSHAW mentioned, that he had ſeen an eel choaked with a water-rat, the two hind legs thereof hanging at the eel's mouth.

Mr. NEILE remarked likewiſe, that he had ſeen an eel in St. James's Park with a duck in his mouth.

Mr. EVELYN gave ſome account of the experiment recommended to him, of putting ſome fleſh and blood in a veſſel covered with flannel, in order to ſee what inſects it would breed; and he obſerved, that it had hitherto bred nothing. He was deſired to continue and proſecute this experiment.

Mr. HOOKE made two experiments, one of a carp, included in a veſſel of water, out of which the air was exhauſted; the other, of extracting the air out of water; which air, after ſome time, will return into water again. He was ordered to bring in an account of the ſucceſs of theſe experiments in writing.

DAVID BRUCE, M. D. was propoſed as a candidate by the lord viſcount KINCARDIN.

The experiments appointed for the next meeting were:

1. That of deſcending bodies in a receiver emptied of air.
2. That of putting water purged of air into the engine.
3. Of condenſing air in the new compreſſing engine.
4. Of killing a mouſe or frog in the ſaid engine.

May 20. The coucil ſat, there being preſent,

The lord viſcount Brouncker, preſident.
Sir Robert Moray.
Mr. Boyle.
Sir Gilbert Talbot.
Mr. Aerskine.
Mr. Slingsby.
Mr. Balle.
Mr. Henshaw.
Mr. Evelyn.
Dr. Goddard.
Mr. Palmer.
Mr. Hill.
Mr. Oldenburg.

Mr. Henshaw was ſworn of the council.

Dr. Bruce and Peter Balle, M. D. (the former propoſed by Sir Robert Moray, the latter by his brother Mr. William Balle) were elected into the ſociety by the council.

It was conſidered again, who ſhould be received as fellows into the ſociety; and the following perſons were unanimouſly reſoved upon to be publiſhed this day in the afternoon at the meeting of the ſociety.

Wedneſday, May 20, 1663.

Reſolved unanimouſly by the council of the Royal Society, that all the perſons in the following liſt be received, admitted, and ordered to be regiſtered fellows of the Royal Society.

William lord Brouncker, preſident.
James lord Annesley.
William Aerskine, eſq;
John Alleyn, eſq;
Elias Ashmole, eſq;
John Austen, eſq;
John Aubrey, eſq;

George duke of Buckingham.
George lord Berkeley.
Robert lord Bruce.
Robert Boyle, eſq;
Richard Boyle, eſq;
William Brereton, eſq;
Thomas Baynes, M. D.
Isaac Barrow, B. D.
William Balle, eſq;
Peter Balle, M. D.
John Brooke, eſq;
David Bruce, M. D.
George Bate, M. D.

William lord Cavendish.
Walter Charleton, M. D.
Timothy Clarke, M. D.
Edward Cotton, D. D.
Daniel Colwall, eſq;
John Clayton, eſq;
Thomas Cox, M. D.
William Croune, M. D.
John earl of Craford and Lindsey.

Henry marquis of Dorchester.
William earl of Devonshire.
Sir Kenelme Digby, knt.
Sir John Denham, knight of the Bath.
John Dryden, eſq;

Seth lord biſhop of Exeter.
George Ent, M. D.
John Evelyn, eſq;
Andrew Ellise, eſq;

Sir Francis Fane, knt. of the Bath.
Sir John Finch, knt.
Monſ. le Febure.

Francis Glisson, M. D.
Jonathan Goddard, M. D.
John Graunt, eſq;

Christopher lord Hatton.
Charles Howard, eſq;
William Hoare, M. D.
Sir Robert Harley, knt.
Nathaniel Henshaw, M. D.
Thomas Henshaw, eſq;
James Hayes, eſq;
William Holder, D. D.
Theodore Haak, eſq;
William Hammond, eſq;
Abraham Hill, eſq;
John Hoskins, eſq;
Mr. Robert Hooke.

Richard Jones, eſq;

Alexander earl of Kincardin.
Sir Andrew King, knt.

John lord Lucas.
James Long, eſq;
Anthony Lowther, eſq;

John lord viſcount Massareene.
Sir Robert Moray, knt.
Sir Anthony Morgan, knt.
Christopher Merret, M. D.

James earl of Northampton.
Sir Paul Neile, knt.
Sir Thomas Notte, knt.
William Neile, eſq;
Jasper Needham, M. D.

Henry Oldenburg, eſq;

Sir William Persall, knt.
Sir William Petty, knt,
Sir Richard Powle, knight of the Bath.
Sir Robert Paston, knt. and bart.
Sir Peter Pett, knt.
Walter Pope, M. D.
John Pell, D. D.
Peter Pett, eſq;
Henry Powle, eſq;
Thomas Povey, eſq;
Dudley Palmer, eſq;
Henry Proby, eſq;
Philip Packer, eſq;

William Quatremain, M. D.

Edward earl of Sandwich.
Sir James Shaen, knt.
Charles Scarburg, M. D.
Thomas Stanley, eſq;
George Smith, M. D.
Henry Slingesby, eſq;
Alexander Stanhope, eſq;
Robert Southwell, eſq;
William Schroter, eſq;
Thomas Spratt, M. A.

Sir Gilbert Talbot, knt.
Christopher Terne, M. D.
Samuel Tuke, eſq;

Cornelius Vermuyden, eſq;

Sir Cyrill Wyche, knt.
Sir Peter Wyche, knt.
John Wilkins, D. D.
John Wallis, D. D.
Daniel Whistler, M. D.
Edmund Waller, eſq;
Joseph Williamson, eſq;
Francis Willughby, eſq.
William Winde, eſq;
John Winthrop, eſq;
Matthew Wren, eſq;
Thomas Wren, M. D.
Christopher Wren, LL. D.
Edmund Wylde, eſq;

It was voted, that the perſons following be a committee, to conſider and make report of the ſtatutes of the ſociety, *viz.*

Sir **Robert Moray.**
Mr. **Boyle.**
Mr. **Slingesby.**
Dr. **Wilkins.**
Dr. **Goddard.**
Dr. **Ent.**
Mr. **Palmer.**
Mr. **Hill.**
Mr. **Oldenburg.**

And that any three of them be a quorum.

It was reſolved, that there ſhould be an obligation, to be ſubſcribed by every fellow of the ſociety:

That the committee of the council ſhould conſider of the ſaid obligation: And

That Sir **William Persall**, Dr. **Charleton**, Mr. **Pell**. and Monſ. **le Febure**, be diſpenſed with for their whole weekly payments; and Dr. **Wallis** and Dr. **Christopher Wren**, for the half thereof.

Of theſe, Dr. **Charleton** and Mr. **Pell** had been formerly, *viz.* Aug. 13, 1662, exempted from all payments; and Dr. **Wallis** and Dr. **Wren**, from half, on Dec. 3, 1662.

It was reſolved, that no perſon be regiſtered fellow of the ſociety until he ſhall have ſubſcribed ſuch obligation as the council ſhould agree upon.

At the meeting of the **Society** in the afternoon of the ſame 20th of May[*], the experiments of killing frogs with pitch, quickſilver, and vinegar, was made. It did not ſucceed with quickſilver and vinegar, but a good quantity of pitch being put upon one, killed it at laſt.

Mr. **Waller** mentioned, that toads love to come abroad out of the woods and other ſhady places in moiſt and cool weather: And Col. **Long** added, that they uſe to walk a good way off from their forms, and return into the ſame. He alſo ſuggeſted a means of driving frogs and toads out of ponds, as well of ſtagnant as running waters, by burning old ſhoes, and putting them at the head of the pond where the water comes in; affirming to have ſeen them come out by hundreds upon the uſe of this trick.

Mention being made of toads infecting ſage, Mr. **Waller** alledged, that it had been obſerved in a microſcope, that ſage hath little cavities, uſed to be filled with ſmall ſpiders; and that this was the cauſe, which made the plant noxious, if not well waſhed.

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[*] Monſ. de **Monconys** was preſent at their meeting. See his *Voyage d'Angleterre*, p. 68, 69, 70.

Col. Long having related divers conſiderable obſervations of his concerning inſects, and having made a collection thereof, was deſired to communicate them, and to continue his curioſity, in obſerving farther their various productions and changes, at what times, and upon what plants or leaves they breed, how much time they take for their changes, *&c.*

He took particular notice, that even bitter herbs have their inſects, as rue particularly hath a caterpillar, that feeds upon it, as ſilk-worms do upon mulberry-leaves.

Mr. Pell obſerved, that ſilk-worms, after they were changed into butterflies, and had laid their eggs, and died, being put up by himſelf into a wooden box tied over with a paper cover, produced, after ſome time, a ſort of flies, which eat through the wood. This was mentioned, in order to excite others to obſerve more than had been hitherto done, the changes of inſects after they are dead.

Col. Long remarked, that he uſed to line the inſide of the boxes, wherein he ſhut up inſects, with camphire, to prevent the inſects from boring them through.

Mr. Waller related, that in an iron candleſtick, ſuch as wax-candle is wound upon, after the candle was burnt down to that part, which claſps it in, and had heated it, there was heard about that part a noiſe like that of a death-watch, continuing for a while, and then ceaſing; and that putting his finger upon it, when ſomewhat cooled, he found the iron beat like a pulſe.

Col. Long ſeconded him, and ſaid, than an iron back in a chimney well heated, uſeth to make a noiſe like that of bell-metal.

Mr. Hooke added, that blowing a glaſs ball with a lamp, after it was come to a certain degree of heat, he had heard a ſound in it like that, which is made in the experiment of drawing a wet finger about the lip of the glaſs with water, which there by that preſſure is made to triſk. He obſerved farther, that the glaſs being all red-hot, the noiſe ceaſed; but returning, in the cooling, to the former degree, was heard again till it became cold, and ſo ceaſed.

Dr. Goddard mentioned, that wainſcotted rooms were heard to make a cracking noiſe in the mornings and evenings, according to the various temper of the air as to moiſt and dry.

Col. Long related, that he had ſeen young aſh-trees grown upon a rotten block of aſh-wood in ſuch a manner, that they were ſprung up, and had their roots, in the very rotten part of the ſtump; adding, that theſe young trees, thus ſprung up, being tranſplanted, grew up and thrived like other trees; and that there was no other aſh-wood near to that place where the ſaid block ſtood: ſo that there could be no ſuſpicion of aſh-keys blown from thence to that rotten aſh.

Mr. Boyle ſaid, that the very ſtems of potatoes being put into the ground alone produce good roots.

Col. Long obſerved, that a bean cut into two or three pieces produces good beans.

Mr. Waller related, that in a beech-wood of his, the beech being cut down, other kinds of trees ſucceeded, as hazels, willows, and ſallows, that had never grown there before.

Sir Robert Moray mentioned, that in Scotland, at Darnway, on the river Tindarne, in the province of Moray, where nothing had grown but oak, in a wood three miles long, there grew then nothing but birch; and that he had ſeen in the ſame wood a birch grown out of an oak.

Dr. Whistler obſerved, that darnel never comes, but where wheat or other corn grows.

Col. Long ſaid, that in any new ground, as in ditches newly thrown up, blue-bottles, poppies, *&c.* will grow.

Mr. Packer affirmed, that in Surrey, near Mr. George Evelyn's houſe at Wotton, a whole wood of oaks being cut down, nothing but beech was grown inſtead of it.

Mr. Henshaw mentioned, that he had ſeen a great holly grown out of an aſh-tree.

Mr. Brereton related, that in the marſhes or boggy grounds of Cheſhire, there are found, buried under ground, firs and firm black oak.

He mentioned likewiſe, that ſerjeant Newdigate had aſſured him, of his having often ſeen, in Northamptonſhire, a tree cut in the middle, the heart of which was aſh-wood, and the exterior parts oak.

Mr. Packer ſaid, that he had ſeen an elm in Berkſhire, about a mile from Farringdon, which had been cut towards the root, and was in the cut part petrified. He was deſired to produce that outwardly petrified piece, which he ſaid he had of that wood.

Mr. Hoskyns moved, that a good inquiry ſhould be made into thoſe ſubterraneous trees, that are found buried under ground in Cheſhire, Lancaſhire, and elſewhere. The conſideration of this was referred till the next meeting; as alſo that of the trees ſaid by Col. Long to be found in his mines.

Mr. Hooke produced three microſcopical obſervations: 1. Of the head of an ant: 2. Of a ſtrange fly like a gnat: 3. Of the point of a needle.

Dr. Goddard produced a curious piece of petrified wood, which was given to Mr. Hooke to have it cut even, in order to ſee, whether it would poliſh.

Dr. Charleton undertook to ſhew in a fiſh the *ductus* from the bladder to the gills; and the operator was ordered to provide a brace of carps againſt the next meeting.

Dr. Bruce and Dr. Balle were elected into the ſociety by the council, according to the power granted to the council by the charter for the ſpace of two months from the date of it.

Dr. Croune brought in the following account of a tench tried in the exhauſting engine[t].

“A tench being put into the receiver, and the air exhauſted, died: her belly was opened, and the ſwim or bladders were found flat and empty, and ſunk down cloſe upon the back and ſides. To find whether they were broken, or only the air ſucked out, and the bladders left whole, the fiſh was again put into the receiver, and the air being pumped out, the bladders were diſtended, as if they had been full blown: from whence it was thought, that while the fiſh was alive, the air was drawn out by ſome duct, through which ſhe takes it in; but after ſhe was killed, that paſſage was cloſed up with clammy and glutinous matter: which happens upon the ſubſiding of all parts in dead creatures.”

Mr. Hooke brought in likewiſe the following account of what happened to a carp included in a veſſel of water, out of which the air was pretty well exhauſted[u].

“A middle-ſized carp was put into a veſſel of water, which was afterwards cloſed up and pretty well evacuated of air: this carp, all the time the air was exhauſting, was obſerved to float at the top of the water; and though by ſtrugling it endeavoured to get to the bottom of it, yet it no ſooner ceaſed that endeavouring, but it was buoyed up to the top. After the veſſel was pretty well emptied, the air was readmitted, and thereupon the carp ſunk down to the bottom of the veſſel like a ſtone, not at all moving its body, but only breathing the water (if I may ſo call that action, by which fiſhes take in the water at their mouths, and force it out at their gills) then being taken out of the veſſel, it was very dexterouſly and carefully opened by Dr. Clarke, who found, that the bladder was manifeſtly broken in two places.”

May 27. Col. Long obſerved, that the glaſs was blaſted where toads live; and that the ſurface of ſuch blaſted earth being taken away, ſeveral toads were found lying under it.

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[t] Original Regiſter, vol. ii. p. 224.

[u] Ibid.

Mr. HOOKE was charged to look upon ſage with a microſcope, and to obſerve, whether there lurked any little ſpiders in the cavities of the leaves, that might make them noxious.

Dr. POPE ſaid upon this occaſion, that ſpiders ſeemed to be poiſonous, becauſe he had obſerved, that a fly bit by a ſpider died immediately; whereas another fly, whoſe head is pulled off, will ſtir a pretty while after it. To this Col. LONG added, that a merlin would kill a partridge preſently, ſo that it ſhould lie quite motionleſs; whereas another partridge, whoſe head was wrung off, would flutter a while after: which made him ſurmiſe, that in both caſes the fright might rather be the cauſe of the ſudden death than any poiſon.

Col. LONG deſired farther time to make his collection of inſects for a preſent to the ſociety.

He ſhewed an ermin, taken in Wiltſhire about Dracot, as white as thoſe that come from abroad, and having likewiſe the tail black.

Sir ROBERT MORAY recommended the improvement of ſilk-making heretofore begun in England. In order to which it was ſuggeſted, that white mulberries ſhould be increaſed; for which their growth by cuttings put in good ground was by Col. LONG preferred as more ſpeedy, before their propagation from roots. It was alſo mentioned, that eggs of ſilk-worms brought from abroad out of warmer countries, would thrive better; Monſieur MONCONYS affirming, that in France they ſend for eggs out of Italy, and offering himſelf to procure a good quantity of them; as alſo to give a full account of the way uſed in France in ordering ſilk-worms.

Mr. HOWARD was deſired to purſue the planting of mulberies.

Mention was made of Dr. BRIAN, a clergyman of Coventry, who had ſo much ſilk made by his family, that they furniſhed themſelves with ſilk-ſtockings.

Col. LONG affirmed, that in the Indies the ſilk-worm-flies having eat themſelves out of the balls fly away to the mulberries, laying eggs upon the leaves thereof, which vivify and feed there, *&c.*

Sir ROBERT MORAY gave occaſion to inquire of what importance the cuſtom was of changing ſeed-corn every year: concerning which Col. LONG thought it a point of great advantage to change the ground from worſe to better, and to ſow lean and ſmall corn in richer ſoil. He added, that though huſbandmen ſeldom ſow the ſame grain in the ſame ground; yet he knew barley to be ſown upon the ſame land for ſeveral years together with good ſucceſs. He obſerved farther, that corn will ſmut, if from one rich ground it be ſown upon another rich ground; but not ſo much the ſecond as the third and following years.

Mr. BRERETON mentioned, that in Cheſhire, in order to preſerve corn from ſmut, as alſo from being eaten by birds, they ſteep it in brine ſprinkled with lime.

Mr. HOSKINS ſaid, that Col. SANDYS intended to bring gravel from the ſea-ſhore out of Cornwall into Herefordſhire, to manure the ground with.

Sir ROBERT MORAY inquired, whether manuring the ground with lime, makes wheat more wholeſome or not? Col. LONG ſaid, that the ſign of the wholeſomeneſs of corn being to keep well; and corn grown from lime or other good natural manure, keeping better than from compoſt or dung, or other foul manure, it was manifeſt, that liming the ground made the corn wholeſome. He obſerved farther, that aſparagus, and other herbs growing from rank manure, were not ſo good, nor ſo firm or well taſted, as thoſe that grew from a good natural ſoil, or from a clean manure.

Mr. AUBREY mentioned, that liming the ground altered the wool for the worſe; and that it was found ſo by experience in Herefordſhire.

Mr. BALLE ſaid, that though wool grew coarſer from limed ground, yet the ſheep thrived better by it; which he ſaid he had obſerved in Devonſhire.

Mr. BRERETON remarked, that ſheep without horns, if brought into a wood-land or downs, or other hard country, will get horns in a few generations; and, on the contrary, if they come out of a wood-land country into a low-land and rich paſture, loſe their horns.

Col. LONG affirmed, that the large-horned oxen, brought into Somerſetſhire, or other rich ſoil, get ſhort heads.

The odd production of trees of different kinds growing upon one another being mentioned again, Dr. GLISSON obſerved, that an aſh ſometimes grows upon a willow; and that himſelf had ſeen an aſh ſo grown upon the head of a rotten willow, that it had ſhot its root through it into the ground, and grew up, thruſting the willow out of its place.

Sir ROBERT MORAY related, that in Scotland, near Lough-brum, between the lough and a hill, there was an old fir-wood, all fallen down, the trees lying croſs over one another to a man's height, and in part covered with moſs, the earth being grown and raiſed up to theſe trees, though not yet ſo high as to touch the top: which he conceived it would do in progreſs of time, and ſo bury the trees, as it is found in Cheſhire and elſewhere.

Mr. HOSKINS ſaid, that in Lincolnſhire it did not dew upon theſe parts, where trees lay buried under ground; and that by that token ſuch trees were found out.

Upon this occaſion Mr. BRERETON was deſired to make farther inquiry concerning thoſe trees, which are found buried in Cheſhire, and to obſerve their poſture, depth, weight, figure, ſmell when burned, &c.

Hence ſome of the ſociety conceived, that the earth grew, and in time covered fallen trees: that turfs grew again, and filled up the cavities made in ſuch ground by digging: that mountains grew, ſince there was continually ſo much waſted of them by the rain waſhing away much of the earth; and that this, if not ſupplied by their growing, would in time very ſenſibly leſſen them. Others thought, that ſeveral mountains, which were not rocky, were indeed by ſuch waſhings leſſened; and that others of them were raiſed, but ſuch only as are vulcano's, that make eruptions, and by caſting up new matter, raiſe them to a greater height.

It was alſo diſcuſſed, whether minerals grew; upon which Mr. Brereton obſerved, that in Cheſhire he had found very many different kinds of veins under ground; and that the deeper veins were nearer to ore and metal; the higher were earthy.

Sir Robert Moray conceived, that, for aught we know, all minerals might have been ſo from the beginning; and he ſaid, that he ſhould be glad to ſee any thing no metal become metal.

Others thought, that minerals were produced by certain ſubterraneous juices, which paſſing through the veins of the earth, and having mingled therewith, do afterwards precipitate and cryſtallize into ſtones, ores and metals of various kinds and figures, according to the various kinds of ſalts contained in the juices and the earth.

Dr. Pope alledged the obſervation of Monſieur Peireskius concerning a ground in the river Rhône, which having been found by him even and ſomewhat ſoft under his feet at one time, was found hardened into oval ſtones ſome days after.

He mentioned likewiſe, that having evaporated ſome of the petrified water of Oaky-hole, no ſtony matter ſubſided.

Sir Robert Moray ſaid hereupon, that, according as the evaporation was made, ſtony parts ſubſided or not: that himſelf had diſtilled ſome of the Spa-water by fire, and nothing remained at the bottom: but when he evaporated of the ſame in the ſun, there remained ſomething; the violence of the fire carrying all away; but the gentler heat of the ſun leaving groſs matter behind.

Dr. Clarke related, that in a certain field in Suſſex, the ſtones being carried away by twenty or thirty loads once in two or three years, the place was found continually filled again with ſtones.

Dr. Goddard ſpoke of the production of grey marble, made of cockles and other ſhells compacted by intercurrent ſtony juices; there being a continual permeation of various kinds of them through the earth, whereby the ſeveral parts thereof are ſtrangely ſhifted from one place to another.

Dr. Glisson thought, that the petrification of wood was occaſioned by the paſſing of ſtony juices into the pores of wood throughout, and by the filling them all up, and ſo coagulating there, without changing any thing of the figure of the wood.

Mr. Hooke produced Dr. Goddard's petrified wood, being cut ſmooth, and having a poliſh; which being viewed by him in a microſcope in its cloſeſt part, ſtill appeared porous. He was deſired to cauſe the ſame ſtony wood to be cut ſideways; and alſo to bring in his obſervations upon it.

Dr. Goddard read his account of an experiment of a tube and quickſilver, which was ordered to be regiſtered[r], as follows:

" A tube of glaſs of ſo wide a bore, as might conveniently be ſtopped with the " finger's end, and about three foot in length, was let down erect into a veſſel of " quickſilver, of ſufficient depth to float in that poſture, and ſo ſupported from " inclining to any ſide, as left withal at liberty to perpendicular deſcent: then a " mark was affixed at the lower extremity of the part borne above the ſurface of " the quickſilver: after being taken up, and the end that had been immerſed be- " ing cloſe ſtopped with the finger, it was filled with quickſilver, and then the " upper end being alſo cloſe ſtopped with the finger or thumb of the other hand, " being carried erect, the former end was immerſed under the ſurface of the quick- " ſilver, and the finger ſtopping it taken away; and ſo the tube being kept cloſe " ſtopped at the upper end, was warily let down to the bottom of the veſſel con- " taining the quickſilver. After all, the tube did ſtick ſo faſt to the finger or " thumb ſtopping the upper end, as to be lifted thereby ſome inches above the " mark of its immerſion, and ſometimes it was lifted quite out of the quickſilver " in the veſſel.

" And whereas it was ſuggeſted, that a tube of a leſſer bore than thoſe, with " which the experiments were made, ſo ordered, would riſe preciſely to the mark " of the immerſion (the former being raiſed higher, by the advantage of the pulp " of the finger forced farther into the upper end) it was found indeed much more " difficult to raiſe it at all (the ſkin and grain of the finger not ſo cloſely comply- " ing and touching in all parts, when applied to a ſmaller bore) and though ſtick- " ing firmly at the firſt raiſing, yet it would fall off before it could be raiſed to " the mark of immerſion before mentioned."

Mr. Hooke brought in his microſcopical obſervation of a male gnat. He was ordered to bring in writing the experiment of air exhauſted out of water, and relapſing into it again.

At a meeting of the Council the ſame day were preſent

The lord viſcount Brouncker,
preſident.
Sir Robert Moray.
Mr. Boyle.
Mr. Aerskine.
Dr. Ent.

Dr. Goddard.
Dr. Clarke.
Mr. Balle.
Mr. Palmer.
Mr. Hill.
Mr. Oldenburg.

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[r] Original Regiſter, vol. ii. p. 225.

It was ordered, that Dr. Goddard deliver the charter of the ſociety to Mr. Elias Ashmole, in order that the arms of the ſociety, and the clauſe concerning the ſame, may be inrolled in the herald's office.

The committee having preſented to the council the draught of the obligation to be ſubſcribed by the fellows of the ſociety, it was, after ſome alterations, agreed upon as follows:

> " We, who have hereunto ſubſcribed, do hereby promiſe each for himſelf, that
> " we will endeavour to promote the good of the Royal Society of London for improving
> " natural knowledge; and to purſue the ends, for which the ſame was
> " founded: That we will be preſent at the meetings of the ſociety, as often as
> " conveniently we can, eſpecially at the anniverſary elections, and upon extraordinary
> " occaſions: And that we will obſerve the ſtatutes and orders of the ſaid
> " ſociety: Provided, that whenſoever any of us ſhall ſignify to the preſident under
> " his hand, that he deſireth to withdraw from the ſociety, he ſhall be free from
> " this obligation for the future."

It was ordered, that the ſaid committee bring in a draught of the ſtatute for the aforeſaid obligation at the next meeting of the council: And

That the next council be ſummoned to meet on the Wedneſday following, between nine and ten in the morning, to conſider of changing the time of their meeting.

Upon the reading of a letter ſent out of Ireland to the ſecretary concerning the expectation, which the committee, that had heretofore given the ſociety an account of Sir William Petty's new ſhip, entertained of hearing the ſenſe of the ſociety thereupon; it was ordered,

That the committee ſhould be put in mind by the ſecretary, that the matter of navigation being a ſtate concern was not proper to be managed by the ſociety: and that Sir William Petty, for his private ſatisfaction, may, when he pleaſes, have the ſenſe (if he hath it not already) of particular members of the ſociety, concerning his new invention.

June 3. The Council met again, at which were preſent

The lord viſcount Brouncker, preſident.
Sir Robert Moray.
Sir Kenelme Digby.
Sir Gilbert Talbot.
Mr. Aerskine.
Mr. Slingesby.
Mr. Balle.
Mr. Evelyn.
Mr. Henshaw.
Dr. Clarke.
Dr. Goddard.
Mr. Palmer.
Mr. Hill.
Mr. Oldenburg.

Sir Kenelme Digby was ſworn of the council.

Dr. BATE having preſented the ſociety with ten pounds ſterling by the hands of Dr. CLARKE, and deſired to be continued a member of the ſociety; it was ordered,

That Dr. CLARKE ſhould give him the thanks of the council for his reſpect and kindneſs to the ſociety; and that Dr. GODDARD draw up a form of this order.

Dr. BATE was elected into the ſociety by the council.

Mr. EVELYN preſented the ſociety from Sir RICHARD BROWNE with a cuſhion to put their mace upon.

It was reſolved, that the council meet henceforth on Wedneſdays in the afternoon at two of the clock.

It was ordered, that the committee bring in a law obliging the preſident to be covered, except when he ſpeaks to the whole ſociety: as alſo, that they take a review of the former draughts for the making and repealing of laws, and alter them ſo, that the repealing as well as the making of a law be conſidered but twice on two ſeveral days: And

That Mr. PALMER inform himſelf of ſome lawyers, whether it be neceſſary to have all the by-laws of the ſociety confirmed by the lords chief juſtices; and if ſo, whether any of ſuch by-laws can be repealed without the reviſing of the ſaid chief juſtices.

The committee preſented the council with a draught of a ſtatute for the obligation to be ſubſcribed, and of another for the weekly payments: both which were recommitted.

Mr. HOOKE was elected a fellow of the ſociety by the council, and exempted from all charges.

At a meeting of the SOCIETY on the ſame day, the experiment of raiſing water in a kind of ſmall weather-glaſs, by the preſſing in of air in the condenſing engine, was tried; but by reaſon of the engine's leaking, proved imperfect, and was therefore ordered to be repeated at the next meeting[*].

Mr. HOOKE was ordered to bring in writing his obſervations upon Dr. GODDARD's petrified wood at the next meeting: And

To obſerve by a microſcope, whether there be any cavities in ſage-leaves for little ſpiders to lodge in.

Sir ROBERT MORAY and Mr. HENSHAW were appointed curators of the experiment of incloſing a pebble in a glaſs with water, to ſee whether in time it will grow too big to come out of the hole, through which it was put in.

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[*] See an account of the proceedings of this meeting in Mr. HOOKE's letter to Mr. BOYLE from London, June 5, 1663, printed in Mr. BOYLE's works, vol. v. p. 530.

Col. Long obſerved, that the picking of ſtones from corn-ground impoveriſhes the land; being of opinion, that a cover of ſtones keeps the earth from the injuries of cold, as alſo from the too much exhaling of the goodneſs of the ground.

Dr. Clarke mentioned, that there was a rivulet in Glouceſterſhire, that makes its bed in ſtones, and the water of which being drunk breeds the ſtone, the people thereabouts being much troubled with that diſtemper.

Col. Long ſaid, that once there was brought to king Charles I. a whole box of ſtones coughed out of the lungs.

Dr. Charleton mentioned, that ſtones had been found in the *plexus choroides*.

He related likewiſe, that one Monſieur La Verdure being come from Rochelle into England, after he had been ſeventeen days at ſea, and for want of other proviſions eat little elſe but bread and cheeſe, and drank a conſiderable quantity of brandy, found himſelf, upon coming on ſhore, very much obſtructed with pains in his bowels; and having taken ſeveral glyſters, voided a great many cockle-ſhells; a fact, as Dr. Charleton obſerved, known to many perſons.

Monſieur Monconys[a] related, that a certain widow at Lyons uſed to void bones together with her menſes every month; as parts of the jaw-bone, joints of the back-bone, *&c.* whereof, he ſaid, his brother Monſieur De Liergue at Lyons kept many, of which he would ſend ſome to the ſociety.

Dr. Clarke related, that ſome years ſince a woman in Drury-lane had brought away bones of her child out of her ſides eighteen years after ſhe had been big of that child; having had two girls between the time of that child-bearing and the voiding of the ſaid bones. He was deſired to bring in the complete account of that fact in writing.

Col. Long mentioned, that a lady had brought away the bones of a child by ſiege two years after ſhe had been big thereof.

Sir Robert Moray related, that he had ſeen a man at the Spa in Germany abſolutely motionleſs, except that he eat, drank, and ſpoke; but, for the reſt, could ſtir no more than a log or ſtone: and that he had ſeen a chalky matter come out of the joints of his fingers, cheeks, *&c.*

Col. Long, who was ſeconded by Dr. Clarke, related, that a cornet in Scotland diſſolved the ſtone in the kidneys, and brought it away, by chewing tobacco; which he obſerved to have been recommended by the duke of Albemarle.

Monſieur Monconys mentioned, that a year ago there was a woman at Orleans in France, who died in travail, and being opened, was found to have the child placed between the matrix and the bladder; of which, he ſaid, he could bring the atteſtation of the phyſicians of that city.

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[a] See his *Voyage d'Angleterre*, p. 108.

Sir Robert Moray related, that Sir George Hamilton had lighted on a certain mine in Ireland, that contained an earth yielding lead; which being waſhed out of that earth, and the earth laid aſide, would, after ſome time, be impregnated again with the ſame metal. He affirmed the ſame of the ſaltpetre and vitriol earth about Leige. He promiſed to bring a fuller account thereof in writing.

He produced likewiſe a certain petition lately preſented to the king, for a patent to practiſe a ſecret of making all grain grow plentifully in any barren ground, without laying on any dung or compoſt; ſo that the ſame land ſo ſown ſhould improve yearly, and bear corn conſtantly, at the charge of ten or twelve ſhillings an acre: as alſo of improving all flowers, plants, and young trees to a ſudden growth, and among them vines, orange-trees, *&c.* and all meadows, at a very eaſy rate.

Mr. Henshaw ſuggeſted, that ſaltpetre and cow-dung mingled in water was one of the beſt kinds of imbibition.

Mr. Brereton affirmed, that he had himſelf ſeen 102 ſtalks upon one root of oats, ſuppoſed to have been cauſed by cutting the plant at the new moon.

Col. Long mentioned, that he had known wheat, that was ſown in the ſpring, produce a good crop; and oats ſown in autumn yield very heavy oats.

Mr. Packer related, that there was a perſon at Billinghurſt in Suſſex, who uſed, in flowering-time, to walk in his corn-fields, and, obſerving certain ears of wheat, put marks upon them, which being ripe he laid apart; and would give any man ſecurity, that ſuch grains ſhould never ſmut.

Mr. Henshaw ſuggeſted a way of preventing the ſmut of corn, by paſſing a rope over the ſtanding corn, and ſo ſhaking off the dew; which elſe, its aqueous parts being exhaled, and the clammy ones ſticking to the grain, and being baked there, cauſeth ſmutting.

Col. Long having diſcourſed of his opinion concerning the ſmut of corn, *viz.* that it proceeds from the root, and not the mildew, was deſired to give his diſcourſe in writing.

He mentioned, that the ſowing of the corn in the huſk makes it proſper better than the ſowing it naked: as alſo, that corn threſhed with flails, and thereby bruiſed, is the moſt ſubject to ſmutting.

Sir Robert Moray ſuggeſted the planting of fruit with the pulp about it: to which Col. Long anſwered, that it was known by experience, that excellent peaches are raiſed from the ſtone not ſucked: wherein, however, he diſtinguiſhed, ſaying, that whereas ſome ſorts of peaches, as nectarines and muſk-peaches, come well from ſtones, with ſome pulp left about them; yet other kinds, as the Newington, or Verona peach, do not come well from the ſtone.

Mr. PELL related, that in the granaries of Zurich there was kept wheat in huſks eighty years old.

Dr. CHARLETON was deſired to give, in writing, his account of killing fiſhes by gagging them; and that of the ductus from the bladders of fiſhes to the gills.

June 10. At a meeting of the COUNCIL were preſent,

The lord viſcount BROUNCKER, preſident.
Sir ROBERT MORAY.
Sir PAUL NEILE.
Mr. BRERETON.
Mr. AERSKINE.
Mr. BALLE.
Mr. PALMER.
Dr. GODDARD.
Dr. CLARKE.
Mr. HILL.
Mr. OLDENBURG.

Mr. BRERETON and Sir PAUL NEILE were ſworn of the council.

Mr. PALMER reported, that he had conſulted with ſome able lawyers concerning the neceſſity of confirming the by-laws of the ſociety by the lords chief juſtices; and that they conceived ſuch a confirmation to be unneceſſary.

It was ordered, that the arrears ſhould be collected by the following order:

Wedneſday, June 10, 1663.

"At a meeting of the council of the Royal Society.

"Ordered, that all perſons, that have been elected or admitted into the Royal Society, do pay their whole arrears unto the 24th of this inſtant June, according to their ſubſcription: and that the treaſurer, or collector by him appointed, do repair to every ſuch perſon and demand the ſaid arrears, ſhewing unto them this order, together with the form of ſubſcription hereunto annexed."

Signed by the preſident.

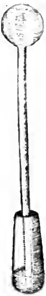
The form of the ſubſcription.

"We, whoſe names are under-written, do conſent and agree, that we will meet together weekly, (if not hindered by neceſſary occaſions) to conſult and debate concerning the promoting of experimental learning: and that each of us will allow one ſhilling weekly towards the defraying of occaſional charges: provided, that if any one or more of us ſhall think fit at any time to withdraw, he or they ſhall, after notice thereof given to the company at a meeting, be freed from this obligation for the future."

It being found, that an order of the council of May 13, concerning the collection of arrears, had been neglected, the council made this reſolution thereupon :

“ Whereas there hath been a neglect in the execution of an order of the council
“ of May 13, concerning the collection of arrears, whereby it might have the
“ more clearly appeared, who ſhould be thought fit to be continued fellows of the
“ ſociety : and whereas the time, wherein the council hath power to elect fellows,
“ is near expired : It is reſolved, that the order of May 20, concerning the non-
“ regiſtering the members of the ſociety, until they have ſubſcribed ſuch obliga-
“ tion, as the council ſhall agree upon, be reverſed.”

At a meeting of the Society[b] on the ſame day, the experiment was begun to be made, to know, whether the ſubſtance of thoſe bubbles, that are obſerved to float at the top of the water in two bolt-heads, after the water hath been well exhauſted out of the receiver, and been re-admitted into the ſame, be real air, or but rarefied parts of that water. And there was put into the place of the bubble remaining in one of the bolt-heads, included in the ſame receiver, as much air, to ſee at the next meeting, whether the one as well as the other return into the pores of the water or not. The account of this experiment was regiſtered[c], as follows :



“ There was taken a bolt-head, holding about four ounces of water :
“ this was filled top-full with water, and the mouth of the ſmall long
“ ſtem was inverted into a ſmall glaſs veſſel, containing water enough
“ to cover about an inch of the ſtem : then both of them, in the poſture
“ here expreſſed in the figure, were ſhut up in a ſmall long receiver,
“ out of which when the air had been well exhauſted, there were obſerved
“ to riſe out of the water, in the bolt-head, abundance of ſmall
“ bubbles, which got up to the top, and remained there in the form of
“ air; and as the air was farther exhauſted out of the receiver, the ſubſtance
“ of thoſe bubbles expanded itſelf ſo far, as to drive down all the water
“ out of the bolt-head. Then the air was readmitted into the receiver,
“ and thereby that expanded ſubſtance was, by the reaſcending of the
“ water into the bolt-head, compreſſed into a ſmall bubble ſomewhat
“ bigger than a large pea; which floated at the top of the bolt head,
“ and remained ſo after theſe veſſels were taken out of the receiver :
“ but being ſuffered to remain in that poſture in a convenient place,
“ after two or three days, the bubble quite vaniſhed, and the ſubſtance
“ returned into the form of water.

“ To know, whether the ſubſtance of this bubble was air, it will be
“ convenient to make further trial, by including two ſuch bolt-heads
“ into the ſame receiver, and after the air hath been exhauſted, and
“ they taken out, to put into the place of the bubble remaining in one
“ of them, as much air, and ſo to let them ſtand till the bubble in the

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[b] See Monſ. de Monconys' *Voyage d'Angleterre*, p. 147 & ſeq.

[c] Original Regiſter, vol. ii. p. 226.

" one or both be vaniſhed: for if that be really air, which hath been drawn out of " the pores of the water, and that it returns thither again, the common air put in " the place of the extracted bubble will do the ſame thing: and if the air does not " penetrate and deſcend into the water, it will be an argument, that thoſe bubbles, " that riſe out of the water, upon the emptying a receiver, wherein it is included, " of air, are not real air, but rarefied parts of water.

" This experiment, according to their directions, was tried June the 10th, and " the ſucceſs was this, that the bubble in both the bolt-heads vaniſhed into the " water within two or three days, but that, which was drawn out of the water, re" turned firſt."

The experiment of killing a mouſe in the condenſing engine ſucceeded not, becauſe the veſſel was not ſtaunch; and it was ordered to be tried again at the next meeting; and that the engine be put into better order.

Dr. Goddard, Mr. Pell, Dr. Pope, and Dr. Croune, were appointed to have the care of ſetting up the long glaſs tube for the Torricellian experiment with water.

Mr. Hooke gave an account of his having looked upon ſage-leaves with a microſcope, to ſee whether in the cavities thereof any little ſpiders lurk; and he ſaid that he had ſeen none.

Dr. Goddard moved, that the trial of the growing of pebble-ſtones in veſſels with water ſhould be made, for more exactneſs ſake, with a gage. Others moved, that it might be made by ſeveral perſons in ſeveral waters.

Mr. Long affirmed, that he could ſhew a pebble thus grown in water to double its quantity in a ſhort time.

Monſ. de Sorbiere mentioned, that, near Paris, he had obſerved two ſtones, that had been two foot diſtant from one another, to be now almoſt grown cloſe together.

Mr. Brereton related, that in Cheſhire there was a place, that within the laſt thirty years had been known to be nothing but ſand, and was now a firm rock.

Dr. Clarke ſaid, that one of the arches of London bridge, *viz.* the fourth from Southwark ſide, had a great rock concreted to it; ſo that whereas the watermen had formerly eſteemed that arch to be the ſafeſt to paſs, they now held it to be the worſt. He and Dr. Charleton added, that the like was to be obſerved on the walls by the water-ſide of Whitehall. And they were both, together with others, deſired to make a farther inquiry concerning theſe accretions.

Col. Long mentioned, that he had obſerved, that earth being very curiouſly ſifted, would not, after two years, paſs through the ſame ſieve.

Dr. CHARLETON took notice of the accretions made to the ſtones under the waters at Bath; and was deſired to make farther obſervations of them, as he had occaſion.

Mr. HOOKE's obſervations upon Dr. GODDARD's piece of petrified wood were appointed to be read at the next meeting.

Dr. CLARKE was again deſired to bring, in writing, the account given by him, June 3, of a woman, who brought away the bones of her child out of her ſide.

Sir ROBERT MORAY's paper concerning the mineral of Liege, yielding both brimſtone and vitriol, with the way of extracting them both out of it, as uſed in thoſe parts, was read, and ordered to be regiſtered [d].

He promiſed to procure a more perfect account hereof.

Col. LONG communicated his obſervations concerning ſmut in corn, with the deſcription of it, and its difference from other vices in corn; together with his conjectures of the cauſes of it, and the moſt probable means to avoid it. His paper was ordered to be regiſtered [e].

It was ordered, that Mr. PACKER ſhould be aſked, who it was at Billinghurſt, in Suſſex, that had the ſkill in marking thoſe ears of corn in flowering-time, which would not ſmut afterwards in two or three years.

Monſ. DE SORBIERE [f] produced a kind of cotton brought from Canada, and growing near Paris between two leaves. Col. LONG obſerved, that he had ſome of the ſame kind; and Mr. HILL ſaid, that New England alſo afforded the like: and ſome other members thought, that the common thiſtle down reſembled it very much, and was as ſtrong and fine.

Monſ. MONCONYS preſented the ſociety with two written papers of his; one containing a way of knowing exactly the difference of the weight of liquors, as he had ſhewed it at the preceding meeting; the other, deſcribing the manner of ordering ſilk-worms in France. Theſe papers were directed to be regiſtered; and the former was as follows [g]:

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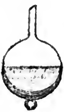
[d] Original Regiſter, vol. ii. p. 229. It is publiſhed in the Philoſ. Tranſact. nº 3. p. 45. May, 1665.

[e] Original Regiſter, vol. ii. p. 231.

[f] He obſerves in his *Relation d'un Voyage en Angleterre*, p. 76. edit. Paris, 1664. that he was introduced to the Royal Society by Sir ROBERT MORAY, who placed him next to himſelf, and interpreted to him, in French, whatever was ſaid there in Engliſh.

[g] Original Regiſter, vol. ii. p. 236.



“ Take a glaſs-vial of this figure, and put into it ſome filings of ſteel, to make it near the weight of the lighteſt liquor known. On the top of theſe filings put ſome white wax, introducing it through the neck in ſmall threads; and when there is enough of it to cover the filings, melt it upon hot aſhes, after you have diſpoſed the filings in ſuch manner, that the center of gravity may be right upon the vial's bottom, oppoſite to the neck, that ſo the vial may always place itſelf perpendicularly upon the liquor and the wax: being grown cold, fix the filings in that ſituation. This done ſeal the vial hermetically; at whoſe bottom without there muſt be a little glaſs ring, to hang it to a little ſilver hook of this figure S, on which certain rings muſt be hung, when the liquor is ſo heavy, that you muſt put much weight upon the vial to make it ſink: for if theſe weights, which are to be added, weigh more than the filings, and if then they ſhould be put upon the neck of the vial, the vial would tumble over. Your engine being thus prepared, you muſt have rings of ſilver, whoſe weight doth ſtill increaſe in double proportion. My rings begin with one, that weighs but the 128th part of a grain of corn; the ſecond weigheth $\frac{1}{64}$; the third $\frac{1}{32}$; the fourth $\frac{1}{16}$; the fifth $\frac{1}{8}$; the ſixth $\frac{1}{4}$; the ſeventh $\frac{1}{2}$, and the eighth a grain: and in remounting, there is one, that is of two penny-weights.

“ The way of making theſe weights, and of adjuſting them is, to take for the leaſt of them ſome ſilver thread, as finely drawn as may be, and to make a ſmall ring of it, having a tail, by wreathing upon the end of the bodkin, and cutting the tail of what length you pleaſe, yet ſo that you may be able to take up the ring by the tail with ſilver pincers. Theſe rings having this figure ○—, you put one of the ſmalleſt you deſire to have upon the vial, by paſſing the neck of the vial into it. Then having put other weights in the hook below, and a ring big enough of braſs or lattin upon it (all which together make the vial deſcend to the bottom of the liquor, into which you put it) you do file the lattin-ring little by little, until you have brought the vial with all theſe weights into ſuch an equilibrium with the water, that it ſtayeth in the middle without riſing or ſinking: then you take off the ſilver ring, and ſubſtitute another in its place, which is heavier, and conſequently ſinks the vial: but you pare its tail little by little, until you reduce the whole to the like equilibrium, to ſtay in the middle of the water without riſing or ſinking: then you are aſſured, that theſe two weights, or little rings of ſilver, weigh equally. Then you put them both together upon the vial, which will ſink thereupon; and to bring it again to an equilibrium, you file the lattin-thread, until the vial ſtay in the middle of the water; and when it ſtayeth there, you take away the two little ſilver rings, and put one in their place of a greater diameter, and a longer tail, that will ſink the vial; but by paring it little by little, you reduce it to the ſame weight with the two little ones together, when the original ſhall again ſtay in the middle of the water, without riſing or ſinking. And in this manner I do adjuſt my weights.

“ To make the compariſon of the weight of liquors, you muſt put this vial into the liquor, and put upon it, or hang on the hook below, as much weight, as is

" neceſſary to make it ſink; and the neceſſary weights will be known, when the " laſt and the leaſt of all maketh the difference thereof; that is, when upon the " adding it to the vial that ſwims, the vial ſinketh, and being at the bottom, " doth, upon the taking away this little ring, riſe again: then ſupputing the weight " of the vial, and that of all the rings, which you have joined thereto, you ſay, " that a volume of water, like to the volume of this vial and the rings of ſilver " joined to it, weigh as much as this vial and the rings thereof.

" Afterward you make the ſame operation in another liquor, and you ſee the " difference, which there is, of one weight from another.

" But if it be objected, that this operation is not juſt, ſeeing the volume is " changed by adding weights; and that thereby you do not make a compariſon " of two like volumes of theſe differing liquors; the anſwer is, that certainly " the equation is neceſſary, but very eaſy: for ſuppoſing (*e.g.*) that the vial be in " a perfect equilibrium with a liquor, as the ſpirit of anniſeed, and the vial weigh " 100 grains; it follows, that a volume of the ſpirit of anniſeed equal to the vial " weigheth 100 grains: then putting the vial into a water, that weigheth much " more than the ſaid ſpirit, I am obliged to add to it a ring, that weigheth " 24 grains.

" 'Tis true, that a like volume of water to that of the vial and the ring " weigheth 124 grains; but yet the difference of the two liquors is not of $\frac{6}{31}$, be" cauſe the volume of water is greater than the volume of the ſpirit of anniſeed, " by the volume of the ring, which was to be added. Wherefore, to make theſe " two volumes equal, you take only away a volume of water like to the volume of " the ſilver, which volume of water would weigh no more than two grains; ſince " it is known, that the weight of ſilver to that of water is as 12 to 1. Wherefore " taking away 2 grains from 124 (which the volume of water, like to the volume " of the vial and the ring, did weigh) for the weight of a volume of water, like " to the volume of the ring, there remain but 122 grains for the weight of a " volume of water, equal to the volume of the vial alone; and conſequently equal " alſo to the volume of the ſpirit of anniſeed, which was equal to the vial: and " ſo you ſay, that the difference of the water to the ſpirit of anniſeed is of $\frac{8}{30}$."

Monſieur MONCONYS promiſed alſo to deſcribe the way of hatching chickens as it is uſed in Egypt.

Mr. HILL mentioned, that ſilk-worms in Virginia, and even thoſe, which are tranſported from Europe thither, are not ſubject to any hurt from thunder.

Mr. PELL remarked, that as himſelf had obſerved flies produced out of dead ſilk-worm-butter-flies put into a box, ſo a friend of his had aſſured him, that ſuch dead butter-flies of ſilk-worms had revived.

Mr. HOSKYNS deſired ſome leads and balls for ſounding without a line for one Mr. JONAS MOORE [b] going to Tangier: upon which the operator was ordered to provide four leads and two balls between that and the Monday following, and to deliver them to Mr. HOSKYNS for Mr. MOORE.

Col. LONG propoſed a way of advancing the manufacture of tapeſtry in England: which was referred to the council.

The operator was directed to give in writing what he had obſerved in the experiment of the ſinking and floating of wheat.

June 17. At a meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER, preſident.
Sir ROBERT MORAY.
Sir GILBERT TALBOT.
Mr. SLINGESBY.
Mr. EVELYN.
Mr. PALMER.
Dr. GODDARD.
Dr. CLARKE.
Mr. HILL.
Mr. OLDENBURG.

The draught of the ſtatute for ſubſcribing the obligation being conſidered again, it paſſed as follows:

“ Every fellow of the ſociety, and every perſon elected, or to be admitted, ſhall
“ ſubſcribe the obligation in theſe words following:

We, who have hereunto ſubſcribed, do hereby promiſe each for himſelf, that we will endeavour to promote the good of the Royal Society of London for improving natural knowledge; and to purſue the ends, for which the ſame was founded: That we will be preſent at the meetings of the ſociety, as often as conveniently we can, eſpecially at the anniverſary elections, and upon extraordinary occaſions; and that we will obſerve the ſtatutes and orders of the ſaid ſociety: provided, that whenſoever any of us ſhall ſignify to the preſident under his hand, that he deſireth to withdraw from the ſociety, he ſhall be free from this obligation for the future.

“ And if any fellow ſhall refuſe to ſubſcribe the ſaid obligation, he ſhall be
“ ejected out of the ſociety; and if any perſon elected ſhall refuſe to ſubſcribe the
“ ſame, the election of the ſaid perſon ſhall be void: neither ſhall any perſon
“ refuſing to ſubſcribe be admitted or regiſtered among the fellows of the ſociety.”

The draught concerning the making of laws paſſed, as follows:

“ For the making of any law or ſtatute of the Royal Society, the draught
“ thereof ſhall be read in council, and put to the vote, on two ſeveral days of
“ their meetings: the firſt day the queſtion to be reſolved by vote ſhall be, whe-
“ ther the draught of the ſaid ſtatute, then agreed upon, ſhall be read at another

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[b] Afterwards knighted, and ſurveyor of the ordnance, and fellow of the Royal Society.

" meeting. The ſecond day the queſtion ſhall be, whether the draught of the " ſaid ſtatute, then agreed upon, ſhall paſs for a law or not."

The draught for the repealing of laws paſſed the firſt time, as follows:

" For the repealing of any law or ſtatute, or any part thereof, the repeal ſhall " be propounded and voted in council on two ſeveral days of their meeting. " The firſt day the queſtion to be reſolved by vote ſhall be to this effect, *viz.* " whether the repeal of ſuch ſtatute, or ſuch part thereof, ſhall be propounded " at another meeting. The ſecond day the queſtion ſhall be to this effect, *viz.* " whether ſuch ſtatute, or ſuch part thereof, ſhall be repealed or not. And in " caſe the ſaid repeal be agreed unto, the ſame ſhall be recorded in the journal-" book of the council, and the ſtatute, or part of the ſtatute, repealed, ſhall be " cancelled in the ſtatute-books."

It was ordered, that the council do meet from henceforth on Mondays, about three of the clock in the afternoon.

At the meeting of the Society on the ſame day, in the experiment of exhauſting air out of water, which returns into the pores of the water again, it was found, that the air, which at the former meeting was put into the place of the bubble, remaining in one of the bolt-heads, was relapſed into the pores of the water, as well as the bubble left in the other bolt-head. And it being ſuggeſted, that the bubbles floating in both the bolt-heads, after the drawing out of the air of the receiver, might be real air got in at the pouring in of the water, and lurking between the water and the ſides of the glaſſes; and that ſuch a parcel of air thus crouded in might, upon the readmiſſion of the air, and the reaſcenſion of the water, be driven up before it to the top: for the clearing of this the operator was ordered to make the ſame experiment in glaſſes of different bigneſs, to ſee, whether the bubbles remain in proportion to the quantity of water, or in proportion to the ſurface of the glaſſes.

The operator was ordered to make the compreſſing engine very ſtaunch; and for that end to try it often by himſelf, that it might be in good order againſt the next meeting, for the trial of ſome experiments with live creatures therein.

Mr. Hooke's obſervations upon Dr. Goddard's piece of petrified wood were read, and ordered to be regiſtered[1], as follow:

" It reſembled wood, in that,

" 1ſt, All the parts of the petrified ſubſtance ſeemed not at all diſlocated or " altered from their natural poſition, whilſt they were wood; but the whole piece " retained the exact ſhape of wood, having many of the conſpicuous pores of " wood ſtill remaining pores, and having a manifeſt difference, viſible enough be-" tween the grain of the wood and that of the bark; eſpecially when any ſide of

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[1] Original Regiſter, vol. ii. p. 240.

“ it was cut ſmooth and poliſhed, for then it appeared to have a very lovely grain, like the grain of ſome curious cloſe wood.

“ Next it reſembled wood, in that all the ſmaller and (if I may ſo call thoſe which are only to be ſeen by a good glaſs) microſcopical pores of it appear (both when the ſubſtance is cut and poliſhed tranſverſly and parallel to thoſe pores) perfectly like the microſcopical pores of ſeveral kinds of wood, retaining both the ſhape and poſition of ſuch pores.

“ It was differing from wood,

“ 1ſt, In weight; being to common water as $3\frac{1}{4}$ to 1: whereas there are but few of our Engliſh woods, that, when dry, are found to be as heavy as water.

“ 2dly, In hardneſs; being very near as hard as a flint, and in ſome places of it alſo reſembling the grain of a flint. It would very readily cut glaſs; and would not without difficulty, eſpecially in ſome parts of it, be ſcratched by a black hard flint. It would very readily ſtrike fire againſt a ſteel, and alſo againſt a flint.

“ 3dly, In the cloſeneſs of it; for though all the microſcopical pores of the wood were very conſpicuous in one poſition, yet by altering that poſition of the poliſhed ſurface to the light, it alſo was manifeſt, that thoſe pores appeared darker than the reſt of the body, only becauſe they were filled up with a more dark and duſky ſubſtance, and not becauſe they were hollow.

“ 4thly, In that it would not burn in the fire; nay, though I kept it a good while red hot in the flame of a lamp, very intenſely caſt on it by a blaſt through a ſmall pipe, yet it ſeemed not at all to have diminiſhed its extenſion; but only I found it to have changed its colour, and to have put on a more dark and duſky brown hue: nor could I perceive, that thoſe parts, which ſeemed to have been wood at firſt, were any thing waſted, but the parrs appeared as ſolid and cloſe as before. It was further obſervable alſo, that as it did not conſume like wood, ſo neither did it crack and fly like a flint, or ſuch like hard ſtone. Nor was it long before it appeared red hot.

“ 5thly, In its diſſolubleneſs; for putting ſome drops of diſtilled vinegar upon the ſtone, I found it preſently to yield very many bubbles, juſt like thoſe which may be obſerved in ſpirit of vinegar, when it corrodes coral. Though I gueſs, many of thoſe bubbles proceeded from the ſmall parcels of air, which were driven out of the pores of this petrified ſubſtance, by the inſinuating liquid menſtruum.

“ 6thly, In its rigidneſs and friability; being not at all flexible, but brittle, like a flint; inſomuch, that with a knock of a hammer I broke off a ſmall piece of it, and with the ſame hammer quickly beat it to a pretty fine powder upon an anvil.

"7thly, It ſeemed alſo very differing from wood to the touch; feeling more cold than wood uſually does, and much like other cloſe ſtones and minerals.

"The reaſon of all which phænomena ſeems to be this:

"That this petrified wood having lain in ſome place, where it was well ſoaked with petrifying water (that is, ſuch a water, as is well impregnated with ſtony and earthy particles) did by degrees ſeparate, by ſtraining and filtration, or perhaps by precipitation, coheſion, or coagulation, abundance of ſtony particles from that permeating water; which ſtony particles, having by means of the fluid vehicle, conveyed themſelves not only into the microſcopical pores, and perfectly ſtoped up them, but alſo into the pores, which may perhaps be even in that part of the wood, which through the microſcope appears moſt ſolid, do thereby ſo augment the weight of the wood, as to make it above three times heavier than water, and perhaps ſix times as heavy as it was when wood. Next, they hereby ſo lock up and fetter the parts of the wood, that the fire cannot eaſily make them fly away; but the action of the fire upon them is only able to char thoſe parts, as it were, like as a piece of wood, if it be cloſed very faſt up in clay, and kept a good while red-hot in the fire, will by the heat of the fire be chared and not conſumed; which may perhaps be the reaſon, why the petrified ſubſtance appeared of a blackiſh-brown colour after it had been burnt. By this intruſion of the petrified particles it alſo becomes hard and friable; for the ſmaller pores of the wood being perfectly ſtuffed up with theſe ſtony particles, the particles of the wood have few or no pores, in which they can reſide; and conſequently no flexion or yielding can be cauſed in ſuch a ſubſtance. The remaining particles likewiſe of the wood among the ſtrong particles may keep them cracking and flying as they do in a flint."

Mr. HOOKE was deſired to continue his obſervations by a microſcope upon ſage-leaves, he having at ſome times ſeen nothing like little ſpiders in the cavities thereof; and at other times abundance of little eggs upon the ſaid leaves.

The lord viſcount MASSAREENE ſignified to the ſociety, that it was any wood, which in a lough of his in the north of Ireland turned into ſtone; and that one part was often wood, and the other ſtone: but he knew nothing of the ſtory of the part turned into iron in the earth under that petrifying water. It was ordered, that his lordſhip ſhould be deſired by the ſecretary to gratify the ſociety with ſuch a piece, part wood, part ſtone; as alſo to inform them, whether there be any amber found in the ſame lough.

Sir ROBERT MORAY was deſired to give an account of the rock concreted to one of the arches of London-bridge.

Dr. CLARKE remarked, that the ſtory of the man, who voided more ſtones than his own weight, was found in CASAUBON upon one of the ſatires of PERSIUS.

Mr. Beale's obſervations concerning the ſmut of corn, as alſo the riſe of the colours of inſects, were read, as they were ſent in a letter of his to the ſecretary; and an extract was ordered to be regiſtered[k].

Col. Long confirmed Mr. Beale's obſervations concerning the ornaments of inſects by ſome of his own of that kind.

Monſieur De la Quintinye's letter from Paris of the 25th of June, 1663, N.S. ſent to Mr. Oldenburg, the ſecretary, for the ſociety, concerning the ordering of melons, after they are knotted and appear in their fruit; as alſo the way of keeping the ſeeds well, was read; and it was ordered, that thanks be returned to him for it, and that an extract of this letter be entered[l].

Col. Long mentioned a way of producing good melons without tranſplanting them; which he promiſed to communicate to the ſociety.

Monſieur Monconys having left in Sir Robert Moray's hands a deſcription of the way uſed in Egypt to hatch eggs, it was ordered to be read at the next meeting.

Dr. Croune was deſired to have the pot with the viper-powder kept by Mr. Pulleyn brought to the ſociety, to ſee whether any thing alive were in it.

Mr Hooke's account of the wheat ſinking and floating again in water, was read, and ordered to be regiſtered[m].

June 22. The council met for the firſt time upon Monday, according to the order of the laſt meeting; and there were preſent

The lord viſcount Brouncker.
Sir Robert Moray.
Sir Paul Neile.
Sir Gilbert Talbot.
Mr Aerskine.
Mr. Slingesby.
Mr. Balle.

Dr. Wilkins.
Dr. Ent.
Dr. Goddard.
Dr. Clarke.
Mr. Palmer.
Mr. Hill.
Mr. Oldenburg.

The council elected into the ſociety the earl of Craford and Lindsey, Sir Edward Bysshe, Sir John Birkenhead, Monſieur Huygens, and Monſieur De Sorbiere.

The draught for repealing of laws paſſed the ſecond time, as it ſtood recorded June 17. without any alteration.

The draught for the time of the ordinary meetings of the ſociety paſſed the firſt time, as follows.

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[k] It does not appear in the Regiſter.

[l] Letter-book, vol. i. p. 85.

[m] This account does not appear in the Regiſters.

“ The ordinary meeting of the ſociety ſhall be weekly upon Wedneſday, beginning about three of the clock in the afternoon, and continuing until ſix ; unleſs the major part of the fellows preſent ſhall for that time reſolve to riſe ſooner or ſit longer : and no fellow ſhall depart without giving notice to the preſident.”

It was ordered, that the committee bring in a draught for a ſtatute concerning the leave to be given to thoſe, who ſhall deſire to be preſent at the meeting of the ſociety, both natives and foreigners, who were not fellows thereof.

Dr. Wilkins was appointed and ſworn vice-preſident of the ſociety.

The committee offered a law for the preſident being covered, *viz.*

“ The preſident being in the chair is to be covered, notwithſtanding the fellows of the ſociety be uncovered, whilſt they ſpeak to him.”

June 24. The council met again, there being preſent

The lord viſcount Brouncker, preſident.
Mr. Aerskine.
Mr. Balle.
Mr. Palmer.
Dr. Wilkins.
Dr. Goddard.
Mr. Hill.
Mr. Oldenburg.

The committee for laws preſented the draught of a ſtatute for permitting thoſe, who were not of the ſociety, to be preſent at their meetings ; and the members of the council preſent approved thereof, as follows :

“ When the preſident taketh the chair, the reſt of the fellows ſhall place themſelves orderly and conveniently for the buſineſs of the meeting : and thoſe perſons, that are not of the ſociety, ſhall withdraw, excepting, that it ſhall be free for any of his majeſty's ſubjects of England, Scotland, or Ireland having the title and place of a baron, or any of his majeſty's privy council of any of his three kingdoms, or for any foreigner of eminent repute, with the allowance of the preſident, to ſtay for that time : and that it ſhall be free for any other perſon, upon leave obtained of the preſident and fellows preſent, or the major part of them, to ſtay for that time : and the name of every perſon permitted to ſtay, of any perſon that moved for him, and the allowance, ſhall be entered in the journal-book.”

It was conſidered, whether in the ſtatute for ſubſcribing the obligation, which paſſed once, June 17, the words, *or to be admitted*, were not ſuperfluous ; and the members preſent having judged them to be ſo, debated, whether thoſe words ſhould be ſtruck out of the ſaid ſtatute, already paſſed without repealing them : or whether they, or the whole law, ſhould be firſt repealed : it was thought fit to refer it to a full council.

It was conſidered alſo of a ſtatute for electing noblemen, and the following was agreed upon:

> “ Every one of his majeſty's ſubjects of England, Scotland, or Ireland, having “ the title and place of baron, or having any higher title and place; and every “ one of his majeſty's privy council in any of the ſaid kingdoms, upon his deſire “ to be a fellow of the ſociety, ſhall be propounded and put to the vote for elec- “ tion on the ſame day, if there be preſent a competent number for making elec- “ tions: if otherwiſe, it ſhall be free for every ſuch perſon to be preſent at any “ meeting of the ſociety, until there be ſuch a number preſent.”

It was ordered, that the preſident take care, that there be always a blank deputation remaining with the council, in caſe of his or his deputy's abſence.

At the meeting of the SOCIETY on the ſame day, Sir JUSTINIAN ISHAM was propoſed a candidate by Col. LONG, and HENRY POWER, M. D. by Dr. WILKINS.

An abſent member[n], who deſired not to be named, preſented by Mr. OLDENBURG, the ſecretary, a book written by him, and intituled, *Conſiderations touching the uſefulneſs of experimental natural philoſophy, propoſed in a familiar diſcourſe to a friend by way of invitation to the ſtudy of it*[o]: for which thanks were ordered to the author, and the book committed to the cuſtody of Dr. GODDARD.

Monſieur HUYGENS preſented to the ſociety from his father[p] a written account of the varieties of earths found in a water-pit bored at Amſterdam in the year 1605; for which thanks were ordered to Monſieur ZUYLICHEM, who was deſired to communicate a ſcheme of the boring engine; and the account was directed to be regiſtered[q], as follows:

“ In the year 1605, the 15th of July, a water-pit was bored at Amſterdam, in “ the hoſpital of old men, deep 232 foot (which is ſome 32 foot higher than the “ ſteeple of the old church there); and the ground was found as followeth:

1. “ Stony and garden ground	7 foot.
2. “ Fine	9
3. “ Soft clay	9
4. “ Sand	8
5. “ Earth	4
6. “ Clay	10
7. “ Earth	4
	51

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[n] Mr. ROBERT BOYLE.

[o] Printed at Oxford, 1663, in 4to.

[p] CONSTANTINE HUYGENS DE ZUYLICHEM. He was in England, and preſent at the preceding meeting of the Royal Society on the 10th of June 1663, together with his ſon Monſieur HUYGENS. See Mr. OLDENBURG's letter to Mr. BOYLE June 10, 1663, in Mr. BOYLE's Works, vol. i. p. 302.

[q] Original Regiſter, vol. ii. p. 243.

8.	" Here followeth the ſand, upon which moſt part " of Amſterdam is founded	10
9.	" Clay	2
10.	" White ſand	4
11.	" Dry earth	5
12.	" Turf bruiſed	1
13.	" Sand	14
14.	" Sandy clay	3
15.	" Sand and clay mingled	5
16.	" Sand and ſea-ſhells	4
		99
17.	" After theſe 99 foot, there is a couch of clean " clay of	102
18.	" Sand, in which the boring ended	31
		232

Dr. Power produced ſeveral microſcopical obſervations made by himſelf: and Dr. Wilkins, Dr. Wren, and Mr. Hooke were appointed to join together for more obſervations of the like nature.

The pot of viper-powder, kept by Mr. Pulleyn, was opened; but nothing alive was found in it. Mr. Hooke was deſired to look upon ſome of the powder through a microſcope, Mr. Pell relating, that Sir Charles Cavendish had kept a box of viper-powder, which being opened and found extremely ſtinking, had ſtore of little moving creatures in it, like mites of cheeſe.

Sir Robert Moray, Dr. Wilkins, and Dr. Goddard were appointed to try the producing of maggots with old cheeſe and ſack.

Dr. Power related, that he had obſerved, that the little fiſhes ſwimming in vinegar diſappeared in the vinegar when frozen, but friſked again upon the thawing of it.

Dr. Goddard and Mr. Pell gave an account of their thoughts about the erecting of the long glaſs-tubes for the Torricellian experiment with water. And it was ordered, that two of them ſhould be erected accordingly againſt the next meeting; and that Mr. Boyle's engine ſhould be applied to it, to ſee, whether the water could be raiſed higher by ſuction.

Dr. Croune was deſired to bring in writing the relation made by him of his ſecond trial of feeding a carp in the air.

Capt. Silas Taylor related, that he knew, that a carp had been fed out of the water for a twelve-month with bread moiſtened in milk in ſome damp place, by feeding it twice a day, and ſwinging it often for refrigeration. And he adviſed, that thoſe carps ſhould be taken for the experiment, which would feed, and had been accuſtomed to it in ponds.

Col. LONG was deſired to make this experiment in the country upon ſuch carps.

Mr. GRAUNT mentioned, that he knew a fiſhmonger, who in 1658 put three carps into a pond, which at the end of four years were multiplied into 875, the ſmalleſt of which were 15 or 16 inches long. He was deſired to bring the ſtory, with all its circumſtances, in writing.

Col. LONG having related ſeveral remarkable facts concerning the ſpawning, generation, and growth of fiſhes, both of thoſe that are carnivorous, and thoſe that feed on weeds, and particularly of ſalmons, pikes, trouts, carps and eels, he was deſired to communicate in writing theſe obſervations of his, and whatever elſe he knew of fiſhes: and in particular, whether carnivorous fiſhes grow ſooner bigger than others: how long the male ſalmons are admitted, before the female ones ſpawn; and at what time of the year, and how often: of the ternary of trouts concerning the breeding of their kinds: of the male-ſalmon's taking care of and defending the ſpawn caſt by the female in a hole; and what he had obſerved in other fiſhes relating to theſe circumſtances. He was deſired likewiſe to add to theſe his obſervations of toads and frogs and their ſpawning; and in particular of toads coupling on land unfruitfully, and of the raining of frogs, *&c.* of the ſpawning of newts and lizzards, and to ſhew ſome of the latter to the company: as alſo the ſtory of the winged ſerpent flying to a tree, the wings of which, he ſaid, reſembled thoſe of a bat.

Mr. GRAUNT mentioned his having been aſſured, that ſalmons of ſix or eight inches long were grown four feet in length in two years time. He was deſired to procure the account of this with all the particulars in writing.

And all thoſe members, who had the opportunity, were requeſted to make ſeveral experiments in ſeveral fiſhes relating to their growth.

Mr. PACKER took notice, that he had ſeen land-newts have fourteen eggs, which being opened had young ones in them, that ran away.

Dr. WILKINS related, that he had kept frogs for a twelvemonth in a tub drawn over with wires; and that he could never ſee them feed upon any thing, though he had often thrown worms into the veſſel, in which they were: but that he obſerved them to change their colour in winter, and turn blackiſh, but in due ſeaſon recover their natural one.

It being queried, whether ſprats have ſpawn, Mr. HENSHAW affirmed, that he had ſeen ſome, which had ſpawn.

It being alſo queried, whether ſprats were young herrings; the earl of CRAFORD-LINDSEY and Col. LONG affirmed, that they were a peculiar ſort of fiſh, and taken in many places where herrings are not.

July 1. At a meeting of the COUNCIL were preſent,

The lord viſcount BROUNCKER, preſident.
Sir ROBERT MORAY.
Mr. AERSKINE.
Mr. BALLE.
Mr. PALMER.
Dr. WILKINS.
Dr. GODDARD.
Dr. CLARKE.
Mr. HILL.
Mr. OLDENBURG.

The ſtatute for the ordinary meetings of the ſociety paſſed, without alteration, the ſecond time, having paſſed the firſt time June 22.

It was voted, that the ſtatute for ſubſcribing the obligation, as it ſtands recorded June 17, with theſe words, *or to be admitted*, be repealed.

The ſame ſtatute, excepting the words, *or to be admitted*, paſſed the firſt time, inſerting theſe words, *or to be elected*, firſt, between the words *elected*, and *ſhall ſubſcribe*; ſecondly, between the words *elected* and *ſhall refuſe*.

It was ordered, that the council meet on the Monday following, about three of the clock, to conſider of experiments proper for his majeſty's reception: and that Col. LONG, Dr. CHRISTOPHER WREN, and Mr. HOOKE, be deſired to meet with them upon this occaſion.

At a meeting of the SOCIETY on the ſame day, July 1, ALEXANDER FRAZIER, M. D. was propoſed a candidate by Sir ROBERT MORAY.

Sir JUSTINIAN ISHAM and Dr. POWER were elected, the latter of whom was likewiſe admitted, the former being abſent.

An experiment was tried with the lungs of a frog in the pneumatic engine, to ſee whether they are only a *cumulus veſicularum*: the ſucceſs of which experiment was, that the lungs ſwelled much upon the exhauſting of the air; but the top of one of the lobes being cut, that lobe was not ſeen to riſe.

Monſ. HUYGENS's experiment of purging water from air, to ſee whether it would ſubſide, according to the Torricellian experiment, was made, but did not ſucceed; and was therefore ordered to be repeated at the next meeting.

Mr. HOOKE's experiment for finding, whether the bubbles, that riſe out of the water upon the emptying a receiver of the air, are real air, or only rarefied parts of water, was ordered to be repeated at the next meeting.

Monſ. LE FEBURE's account of an operation for the volatilizing of tartar was read, and ordered to be tranſlated into Engliſh, and regiſtered [f], as follows:

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[f] Original Regiſter, vol. ii. p. 247.

“PARACELSUS ſaith, in a certain place of his works, that tartar is not to be volatilized, but in itſelf, with itſelf, and by itſelf. Meditating hereupon, I did mix with common rain-water equal parts of pure tartar pulverized, and of very pure ſalt of tartar: then I did evaporate the liquor until the matter was dry, which did remain reddiſh and diſſoluble, not partaking any more of the acid taſte of tartar, nor of the lixivial taſte of the ſalt of tartar. And being deſirous to work ſurely, and according to the precepts of the principal artiſts, I did believe, I ought to mix this reddiſh matter with three times its weight of diſtilled and calcined allum, until it ſeemed to be altogether inſipid, to the end, as well to diſcontinue the parts of this ſalt, as alſo to hinder the ebullition of the matter. I diſtilled all in a cloſe reverberating furnace, according to the degrees of the fire, until all the vapours ceaſed of themſelves: but when the neck of the recipient was unluted from the retort, and I went to ſmell this ſpirit, it was found of ſo ſtrong a force, and of ſo penetrant a ſulphureous volatile ſmell, that no body durſt approach to it, for fear of being ſuffocated; it intercepting the reſpiration, and hindering all the external ſenſes. We did notwithſtanding maſter it, with the loſs of a part of the liquor; and taking the retort from the fire, to judge of the taſte, and of the quantity of the ſalt, that might be left in the *caput mortuum*, I found a ſublimation of (as it were) a black ſoot, ſticking to the upper part of the neck of the retort, and reaching down into its body; which ſubſtance came off by ſcales, and had taken as fine and poliſhed a black as can be ſeen. Afterwards I diſſolved the maſs, that was at the bottom in warm water, and after filtration evaporated it; but the remainder had little or no taſte, though of the nature of ſalt, ſeeing it was diſſoluble. Thus we may ſee the play of nature and art, and how the ſpirits and ſalts do act and re-act upon one another; and that from ſuch a mixture do reſult things, that are beſides the order of nature, and the intention of the beſt artiſts; which alſo doth verify what HELMOT ſaith, *Diſtillatio parit novum ens.*”

Monſ. MONCONYS's deſcription of the way uſed in Egypt of hatching of chickens in ovens, was read, and ordered to be tranſlated into Engliſh, and regiſtered [*].

In this paper he remarked, that this was all the account, which he could at preſent recollect, and that but very confuſedly; but that at his return to France he would ſend the ſociety a deſcription, written by him on the ſpot. He was of opinion, that the temperament of the air in Egypt contributed greatly to the ſucceſs of the method of hatching chickens, ſince the grand duke having ſent for ſome of the chriſtians of Cairo, who are the only perſons, that carry on that buſineſs, they had built an oven at Florence, but failed of hatching chickens.

Dr. WREN was put in mind to communicate to Mr. HOOKE his method of hatching chickens by a lamp.

The operator was again enjoined to make a model of the plough for ſetting of corn, and to bring in a deſcription of the uſes and advantages of it.

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[*] It is bound up among the miſcellaneous papers, nº 16. preſs D D.

Mr. Hooke gave an account, that he had looked with a miſcroſcope upon the viper-powder kept by Mr. Pulleyn, but found nothing alive. He was ordered to continue his obſervations upon ſage-leaves.

The operator was directed to provide hazel-ſticks againſt the next meeting, to make again the experiment of the *virgula divina*.

Dr. Wilkins mentioned, that Dr. Croune had, in the blood of a dog diſſected by him, found abundance of little inſects. Mr. Hooke was deſired to take notice thereof, and to make frequent obſervations with a microſcope on the blood of ſeveral animals.

Mr. Hoskyns related an experiment of the production of bees out of dead bullocks, deſcribed by Mr. Hartlib out of an extract of Mr. Cary, in his *Commonwealth of Bees*[t]. This was directed to be tried in a warm place, but in the ſhade.

Dr. Goddard moved, that a whole animal flayed ſhould be tried, and put up in a jar-glaſs, and covered, to ſee what inſects would be produced from it.

The earl of Craford-Lindsey ſuggeſted a way of producing maggots by horſe-dung and the blood of an ox covered over with bran and earth. His lordſhip promiſed to make the experiment, and to communicate the ſucceſs of it to the ſociety.

Mr. Brereton related, that at Lambeth, under the boards of an hogſty, were once found a buſhel and half of ſnakes.

Capt. Taylor related, that a goſling being killed and covered from the air with a turf, was found, a fortnight after, to have produced many maggots; three of which, being kept a month, were increaſed to the bigneſs of a man's thumb. Col. Long ſuſpected, that they might be bred by the ground itſelf.

Sir Robert Moray preſented the following account of the meaſure of the giant-child born in Scotland, being two and twenty months old[u].

" The checkle bone - - - -	8 1/8	inches."
" The greatneſs of the arm about the elbow -	10 5/6	
" The greatneſs of the leg - - -	11 1/4	
" The greatneſs of his neck - - -	15 1/2	
" The breadth of the ſhoulders - - -	16 1/7	
" The greatneſs of the thigh - - -	19	
" The greatneſs of the head - - -	20 1/2	
" The greatneſs of his waſte above - -	29 1/2	
" His greatneſs below - - - -	31 4/5	
" His height - - - - -	37 1/2	

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[t] Printed at London, 1653, in 4to.

[u] Original Regiſter, vol. ii. p. 249.

Sir ROBERT MORAY communicated likewiſe an account of a very large herring, caught upon the coaſt of Scotland, which, according to that account [w], contained in length 19½ inches; and in breadth, without the fins, 5 inches [x].

Monday, July 6. At a meeting of the COUNCIL were preſent,

The lord viſcount BROUNCKER,
preſident.
Mr. NEILE.
Mr. AERSKINE.
Mr. SLINGESBY.
Mr. BALLE.
Mr. EVELYN.
Dr. WILKINS.
Dr. GODDARD.
Dr. CLARKE.
Mr. PALMER.
Mr. HILL.
Mr. OLDENBURG.

There met with them, according to the order of the preceding meeting, Col. LONG, Dr. CHRISTOPHER WREN, and Mr. HOOKE.

The king's entertainment being taken into conſideration (for which the meeting of the council on this day was appointed) it was ordered,

That Mr. HOOKE and the operator take care ſo to prepare the compreſſing engine, that it might not fail in the trying of experiments therein: And

That the operator take care to have the long tubes ſet up againſt the Monday following.

Col. LONG promiſed to bring in his apparatus of inſects, ſome ſnakes eggs, his collection of curious ſtones, among which were ſome with natural ſcrews; ſome ermines and lizards, natives of England; as alſo ſome exotic beaſts ſkins.

Dr. CHRISTOPHER WREN promiſed to think upon ſome experiments proper for the purpoſe, and to ſend them from Oxford to the preſident. He mentioned the turning glaſs thermometer with an index, left with Dr. GODDARD.

Dr. WILKINS undertook the experiment of raiſing a great weight with a man's breath; and that of the metallic tree, both with mercury, after Dr. POWER's way, red and green; and to engage Dr. POWER to make that magnetical experiment here, which he had made in the country, according to his written account ſent to Dr. CROUNE for the ſociety, *viz.* of altering the polarity of a heated and cooled iron, by repercuſſing the two ends, and of deſtroying all the magnetiſm thereof, by ſtriking ſuch an iron in the middle.

Dr. GODDARD promiſed to ſhew, 1. the way of raiſing a conſiderable weight by the ſhrinking of gut ſtrings moiſtened. 2. The way of raiſing a great weight with a little water. 3. The way of ſucking up a good quantity of water, by drawing the air of the veſſel into the cheſt.

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[w] Original Regiſter, vol. ii. p. 249.

[x] Mr. HOOKE, in a letter to Mr. BOYLE, dated on Friday, [July 3.] from Pall-mall, printed in Mr. BOYLE's works, vol. v. p. 533, obſerves, that there was very little done at this meeting of the ſociety, the whole ſtay being not much above an hour.

Dr. CLARKE promiſed to ſhew, that a frog will live above twenty minutes after his heart hath been taken out, and ceaſed to move.

Dr. ENT was to be deſired by Dr. WILKINS or Dr. GODDARD to prepare the diſſection of an oyſter and lobſter.

Mr. HOOKE was charged to ſhew his microſcopical obſervations in a handſome book to be provided by him for that purpoſe: to weigh the air, both in the engine and abroad: to break empty glaſs balls; as alſo to let the water aſcend into them after they have been emptied: to provide the inſtrument for finding the different preſſure of the atmoſphere in the ſame place, as likewiſe the hygroſcope made of the beard of a wild oat.

It was ordered, that Mr. SLINGESBY give directions for the engraving of the ſociety's arms upon their mace.

It was reſolved the ſecond time, that the ſtatute for ſubſcribing the obligation, as it ſtands recorded June 17, with theſe words, *or to be admitted*, be repealed.

The ſame ſtatue, except theſe words, *or to be admitted*, paſſed the ſecond time, inſerting theſe words, *or to be elected*, twice; firſt, between the words *elected* and *ſhall ſubſcribe:* ſecondly, between the words *elected* and *ſhall refuſe*. See the minutes of June 17, and July 1.

July 8. Dr. CHARLETON preſented the ſociety with the plan of the ſtone antiquity at Avebury, near Marlborough, in Wiltſhire; ſuggeſting, that it was worth the while to dig there under a certain triangular ſtone, where he conceived would be found a monument of ſome Daniſh king. Col. LONG and Mr. AUBREY were deſired to make farther inquiry into it.

Sir PAUL NEILE's diſcourſe of cider was read, and ordered to be regiſtered [r].

Col. LONG was deſired to peruſe all the papers hitherto given in concerning cider, and to reduce them into one compleat hiſtory, adding his own obſervations and experience on that ſubject. Capt. TAYLOR was alſo deſired to communicate what he knew of it in writing.

Mr. WALLER ſuggeſted, that verjuice being an excellent ſauce, the vines yielding it might be planted more plentifully in England. Col. LONG mentioned, that he had planted of them himſelf, and that they will grow well every where in theſe parts.

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[r] Original Regiſter, vol. ii. p. 251.

Sir Robert Moray preſented an account, ſent from the Eaſt-Indies, concerning the temper of the coaſt of Coromandel, and the way of cooling their liquors in thoſe parts, by expoſing them to the heat of the ſun.

It was ordered to be regiſtered [a], and was as follows:

“ Upon the coaſt of Coromandel, 16 degrees northern latitude, between Paleacote and Meſulepatam, 50 leagues in length, yearly, from the 6th of June until mid-Auguſt, certain hot winds blow from the land-ward, beginning at eight in the morning, and continue until four in the afternoon, with ſuch ſuffocating heat, that man is not able to endure it without extraordinary helps and refreſhments; as with keeping in cloſe and dark rooms, and in ſitting up to the neck in fats of ſtone, made for the nonce, and filled with cold water. The thing here worthieſt of obſervation is, that each man, every day, for his proviſion of drink, hangs his pitcher or bottle, made of our common pot-earth, filled with well-water, or other portable liquor of ſeveral ſorts, upon ſome poſt, tree, or wall, or other conveniency at hand (higher or lower as it falls out) in places where the ſun and wind are moſt piercing, where it continues from eight till four in the afternoon, in all the ſcorching heat: and then taken in, as uſually they do, the drink more pleaſant and cool, than any depth of cellarage with us can make it.

“ At that time, cool winds come from the ſea-ſide, and continue all night till eight in the morning, to the refreſhment of all creatures. But if the bottles be ſuffered to continue in the air, as before, during the cool ſea-gales, the liquor grows hot and unfit to drink.

“ The author of this report is a perſon of credit, and hath lived many years in the place; and ſaith, that the inhabitants, nor yet any of the ſtrangers trading there, as Engliſh, Portugals, Hollanders, Perſians, Turks, Armenians, Mogols, and others, underſtand not the reaſons of theſe effects: at the leaſt, that in his time, he never met with any able to give him any probable reaſon for it; nor is it known, that any of the adjacent places are affected with the like accident.”

Col. Long produced ſome of the ſtone matter concreted to an arch of London-bridge, being like an hardened ſandy clay.

Mr. Hooke brought in three microſcopical obſervations, 1. Of the edge of a razor: 2. Of a piece of fine taffata-ribband: 3. Of one of the millepedes.

He was ordered to give, in writing, the two experiments lately made concerning the bubbles remaining on the top of the water in glaſs balls, upon the emptying of the receiver; and the not ſubſiding of the water freed from air.

The operator was ordered to get the long glaſs tubes raiſed againſt the next meeting.

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[a] Ibid. p. 249.

Dr. Fraſier was elected into the ſociety.

July 13. At a meeting of the Council were preſent

The lord viſcount Brouncker, preſident.
Sir Paul Neile.
Mr. Aerskine.
Mr. Balle.
Mr. Palmer.
Mr. Wilkins.
Dr. Goddard.
Mr. Hill.
Mr. Oldenburg.

It was ordered, that every perſon admitted by the council into the ſociety, who had not formerly paid his admiſſion-money, do pay the ſame, being the ſum of forty ſhillings: And

That every perſon elected a fellow of the ſociety ſhall pay, or cauſe to be paid, his admiſſion-money within one month after the ſaid election.

The ſtatute for weekly payments paſſed the firſt time, as follows:

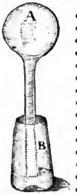
" Every fellow of the ſociety ſhall pay one ſhilling by the week towards the
" charges of experiments and other expences of the ſociety, ſo long as he ſhall con-
" tinue a fellow thereof: which continuance ſhall be accounted from the time of
" his admiſſion until ſuch time as he ſhall ſignify to the preſident under his hand,
" that he deſireth to withdraw from the ſociety; or until, upon any other account,
" he ſhall ceaſe to be a fellow thereof: and if any fellow ſhall refuſe to pay accord-
" ing to the rate aforeſaid, he ſhall be ejected out of the ſociety, except the ſaid
" payment be remitted in whole or in part, by ſpecial order of the council."

It was enacted the firſt time, that in the ſtatute for making laws already paſſed, between the words *ſhall be*, and *whether*, ſhall be inſerted in both places of the ſtatutes theſe words, *to this effect*, *videlicet*.

It was reſolved, that in one of the two ſcutcheons of the ſociety's mace be ingraven the whole arms of the ſaid ſociety, and in the other the following inſcription:

Ex Munificentia
Auguſtiſſimi Monarchæ
CAROLI II.
D. G.
Magnæ Britanniæ, Franciæ, & Hibern. Regis, &c.
Et
Societatis Regalis Londini ad Scientiam
Naturalem promovendam inſtitutæ Fundatoris
et Patroni
Anno 1663.

July 16. Mr. Hooke brought in an account in writing of two experiments tried by the ſociety, one concerning the uniting and mixing of air and water; the other concerning the ſuſpenſion of defecated water in a bolt-head after the receiver had been well exhauſted. This account was ordered to be regiſtered[a], and was as follows:



" A bolt-head, of the ſhape of A, containing about ſix or ſeven
" ounces of water, with a neck about ſix inches long, was filled
" top-full with water, and the mouth of it inſerted into a ſmall
" glaſs body of water as B, and ſo conveyed into the receiver of the
" evacuating engine, and kept there till the receiver had been very
" well exhauſted. Then it was taken out, and the little bubble of
" air, that was found in the bolt-head, and had been drawn out of
" the water, was removed, and as much of the common air put in
" its place, and then ſuffered to ſtand in the poſture repreſented in
" the figure. By this, at the ſame time, was ſet juſt ſuch another
" bolt-head and body, and was filled with common water, out of
" which the air had not been exhauſted; only a bubble of common
" air, about the bigneſs of that which was put into the other bolt-
" head, was left at the top. Theſe being obſerved afforded theſe
" phænomena; the bubble of air in the firſt was obſerved to be
" vaniſhed into the water within a day or two; but the bubble in
" the latter was found not much diminiſhed about a week after."

" A bolt-head and body, juſt like the former, was, upon Monday July the 16th,
" ſet into the receiver, out of which the air was preſently drawn; and the bubbles
" did riſe very copiouſly out of the water into the bolt-head, and beat down all
" the water out of it, below the ſurface of the water in the body. Theſe things
" were ſuffered to remain in this poſture till July the 8th, the receiver being kept
" all the while well exhauſted, by often repeated pumpings: then it was taken out,
" and the bolt-head was filled top-full with this exhauſted water inverted into the
" body, and again included in the receiver. After the receiver was pretty well ex-
" hauſted, there aroſe a ſmall bubble out of the neck of the bolt-head, which get-
" ting to the top, and as the pumping was continued, expanding itſelf, did beat
" down all the water out of the bolt-head as before. Then the bolt head was
" again taken out of the receiver, filled top-full with the exhauſted water inverted
" into the body, and cloſed into the receiver as before: out of which though the
" air was pretty well exhauſted by pumping about half a quarter of an hour, yet
" the water was obſerved to remain ſuſpended in the bolt-head, and not at all
" to deſcend."

The operator was ordered to provide againſt the next meeting a tube of five or ſix feet long, to repeat the latter of theſe two experiments.

Mr. PELL produced a bag containing potter's ſand, which he had been formerly deſired to procure upon a diſcourſe about the advancing the Engliſh potter's art, that it might equal at leaſt that of Germany, if not the old Roman bakers of ſepulchral urns; which then gave occaſion to ſpeak of our Engliſh materials, and our varieties of earths, clays, and ſand. Upon which Mr. PELL related, that in Suſſex, about twenty-ſeven years, he had ſeen a bricklayer make a new oven, wherein he obſerved an unuſual bottom, which the workman had promiſed to make without gapes and chinks, as of one ſtone, and therefore better than if he ſhould uſe bricks, or any ſet of paving tiles. To which end, having brought a ſufficient quantity of ſand (which, as Mr. PELL remembered, looked blackiſh, as if it had been dirty) he ſtrewed it upon the rough bottom of the oven, and then for want of a flat hammer, took an iron wedge, made to cleave wood withal, and with the flat end of it knocked the ſand, and beat it cloſe into a ſmooth floor; which being done, and the oven finiſhed, he, after the uſual manner, put the wood into it, and annealed it. After the oven was cold, the bottom of it ſeemed ſolid and firm, and ſuch as he had undertaken to make it. Nor did Mr. PELL remember, that he ſaw any flaw in it a year after, though it had been uſed for baking perhaps every week.

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[a] Original Regiſter, vol. ii. p. 244, 245.

Upon this occaſion ſome of the members ſuggeſting, that this ſand might be capable of more noble uſes than for ovens, and that it might perhaps be found uſeful for vitrification, or at leaſt ſome untranſparent fuſion, Mr. PELL had been deſired to cauſe ſome of that ſand to be brought to the ſociety, which now came accompanied with a letter of one Mr. NICHOLAS GILDREDGE of Eaſt-Bourne, dated June 29, 1663, giving this farther information, that the ſon of the bricklayer mentioned above, named CARPENTER, had told him, that the way to uſe it was to beat it long with hammers, till it becomes ſo firm and compact, that it may be pared ſmooth with the tools; and that then the great heat of the fire will harden it into a ſtone. But the writer of the letter added, that his uſual maſon, one ROSOM, had told him, that he never ſaw any oven well made with it; but that he ſaw CARPENTER's father make one at Crowlinck, which ſeemed, when in paſte, and after paring, to be very like to do well; and, as he thought, ROSOM ſaid alſo, that after nealing too, it looked firm; yet the firſt or ſecond time it was uſed it mouldered all up again, and he was obliged to bottom the oven again with bricks. The writer of this letter offered to ſend the whole quantity of this ſand, which he had in his houſe, *viz.* near a gallon, if it ſhould be deſired. Mr. PELL and Dr. GODDARD were deſired to examine this ſand, and to make ſome trials of it.

Sir ROBERT MORAY produced the two ſtones found in the earl of BELCARRES's heart, of which he had given a deſcription in writing April 15, 1663.

Dr. CLARKE gave in writing his former relation of a woman, who had carried her child eighteen years in her belly, and then excluded the bones of it, after an extraordinary manner, by an abſceſs in the ſide of her belly. This relation was ordered to be regiſtered [b], as follows:

"In the year 165—, hearing, by common report, of a woman living in Drum-"alley, in Drury lane, that had carried a child eighteen years in her belly, and "now excluded the bones of it after an extraordinary manner, by an abſceſs in the "ſide of her belly, my curioſity, among others, carried me to ſee her. I found

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[b] Original Regiſter, vol. ii. p 270.

" her a woman of ſeven or eight and forty years, tall, ſtrongly made, and appearing " to have been of a good habit of body. She had been now ſome years a widow, " getting her own and a daughter's livelihood, whom ſhe had, of about eleven " years of age, by hard labour; going abroad to waſhing and ſcouring, or ſuch " kind of work, until within ſome few weeks paſt, when ſhe had lived by the charity of thoſe, whoſe curioſity brought them to ſee her.

" I ſaw ſhe had two or three holes from an abſceſs in the left ſide of her *abdomen*, " near the place where the inciſion for a paracenteſis is uſually made, out of which " came matter and ſome bones, which had been the vertebræs of a child; I ſaw divers others ſhe then had in a box, being ſeveral of the bones of a ſcull, the " ſhoulder blades, ribs, vertebres, bones of the limbs, which had all been excluded " from thoſe holes of the abſceſs, and were the bones of a perfectly formed child; " of which ſhe every day yet excluded more. I had from herſelf the following ſtory.

" That about eighteen years before, having after, as ſhe thought, gone her full " time with child, ſhe endured two or three days of ſtrong pain, without any hopes " of being delivered; when one of the women, to give her eaſe, with a large " towel compaſſing the bottom of her belly, lifted it up, ſtanding behind her; " upon which ſhe felt ſome part, as ſhe thought, break within her, and ſomething " remove from the bottom of her belly into her ſide. From this time ſhe felt no more " pain, and by degrees, as ſhe thought, grew well; the ſwelling of her belly ſomething diminiſhing, though continuing always conſiderably ſwelled in the left ſide.

" After two years, or thereabouts, ſhe conceived, and in due time brought forth " a female child, which lived about two or three years; but after four years more, " or thereabout, ſhe brought forth another female child, which was the daughter " I then ſaw with her. She enjoyed her health well, until ſome few months before " I ſaw her, when having a great pain on that part of her belly, which continued " ſwelled, ſhe received from ſome one an ointment, upon uſe of which her belly " being all inflamed, ſhe after uſed poultices to the ſwelled part; which breaking, " and a great deal of matter running out, after ſome weeks ſhe found bones offer " themſelves to come out of the orifices; and from that time, every day for the " moſt part, took out ſome, until I think ſhe had all the bones of a perfectly " formed child."

Sir Robert Moray produced a French letter, giving an account of a ſafe and eaſy way of cutting for the ſtone in the bladder, practiſed by a Frenchman, named Raoux, in France. The letter was ordered to be tranſlated into Engliſh by the ſecretary, and then regiſtered[e], as follows:

" Monſieur Raoux, a famous lithotomiſt, native of Languedoc, having given " very many proofs of his great capacity in cutting the ſtone of the bladder, as " well in his own country as in many other places, is lately arrived in the city of " Paris, where he hath already cut ſome perſons with admirable dexterity, and a " moſt proſperous ſucceſs, after this extraordinary manner.

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[e] Original Regiſter, vol. ii. p. 272.

“ Firſt, without any other preparations but of ſome glyſters, the night next preceding
“ the operation, he maketh the patient to urine, and then ſoundeth him
“ with his *digitus index*, which he introduceth into the *anus*; and having found the
“ ſtone, he maketh the patient take two or three turns in the chamber. Then,
“ having placed him upon the knees of a man ſitting upon a joint-ſtool, who
“ holdeth him about the waſte, two others holding his legs aſunder, the patient
“ himſelf holding and drawing a little his *ſcrotum*, the maſter introduceth again
“ the ſame finger of the left hand into the fundament, joining ſometimes to it his
“ middle finger, according as there is need; wherewith he conveyeth and ſuſtaineth
“ the ſtone in the neck of the bladder, thruſting it towards the left ſide as much
“ as he can, near to the interior part of the *os pubis*; where holding it firm, by putting
“ to it the thumb of the ſame hand, he performeth his operation with his right
“ upon the ſtone, longways, of a bigneſs ſuitable to the bigneſs of the ſtone, cutting
“ firſt the teguments, then making the inciſion upon the neck of the bladder, a little
“ leſs long than that of the ſaid teguments; which inciſion he maketh afterwards
“ a little bigger with his finger: but he quitteth not the inſtrument, which is ſmall
“ enough, and crooked towards the point, cutting on both ſides, before he hath
“ been heard to rake the ſtone with the ſaid inſtrument; and then preſently he
“ thruſteth out the ſtone with the ſame finger, which he keepeth ſtill in the fundament,
“ aſſiſted by the thumb without, and by the hands of thoſe, that hold the
“ legs, making them compreſs the whole *peritoneum*, and the interior part of the
“ *hypogaſtrium*: or elſe he draweth it forth with the thumb and the fore finger of
“ his right hand; with which finger he ſearcheth in the bladder all what is to be
“ drawn out.

“ If the ſtone adhere to the bottom of the bladder, he thence diſengageth it by
“ little and little with the ſame finger, having brought the bottom to the neck,
“ and then he draweth it forth in the ſame manner. After which the patient muſt
“ for a little while be held upright, at which time he maketh him go ſome paces,
“ to void the blood that may be ſhed within thoſe parts; and afterward he cauſeth
“ the patient to lie down, applying only upon the wound of the teguments ſome
“ flour with the white of an egg, the wound of the bladder being retired a finger's
“ ſquare, drawing towards the ſcrotum; either becauſe the bladder withdraws
“ itſelf, having been by force conveyed into the place of the operation;
“ or becauſe the teguments, that hath been drawn towards that ſide, do relax after
“ the operation. Which being done, he wrappeth the patient from the waſte downwards
“ in a linen-cloth, having made a bandage light enough; and the next
“ morning he putteth on an aſtringent plaiſter, and leaveth nothing but a little
“ bandage to hold it on.

“ It is to be obſerved, that all thoſe, whom he hath cut after this manner, have
“ been perfectly cured without any accident, and among others without urining
“ through the inciſion, and without any fever. He alſo cauſeth the patient to obſerve
“ no other diet, than ſuch as is uſed by ſober perſons in health: and ordinarily
“ they riſe the fourth or fifth day, and may go abroad the twentieth or
“ two and twentieth day.”

Sir Anthony Morgan related, that the like way of cutting for the ſtone was known and uſed in Ireland; of which he promiſed to procure a fuller information, and to communicate it to the ſociety.

Dr. Charleton undertook to repeat at the next meeting his diſſection of carps, to ſhew better what formerly he had ſuggeſted about the duct of the bladder to the gills. And the operator was directed to provide three or four carps of a middle ſize for that purpoſe againſt the next meeting.

Dr. Croune being aſked concerning the little inſects, which at the meeting of July 1, 1663, were by another member ſaid to be by him obſerved in the blood of a diſſected dog, ſaid, that he had only found them upon the diſſecting-knife a fortnight after it had been put up.

Sir Robert Moray preſented the ſociety from prince Rupert with a certain water-raiſing engine[d], which was ordered to be tried.

Sir Robert Moray was deſired to procure a fuller information concerning the way uſed on the coaſt of Coromandel for the cooling of drinks by expoſing them in bottles to the ſcorching heat of the ſun all day long; which he promiſed to do.

Mr. Hooke produced three microſcopical obſervations, 1. Of fine lawn. 2. Of a very ſmooth and even gilt edge of fine Venice-paper. 3. Of a *tinea argentea.*

Sir Robert Moray read out of a letter from Sir William Petty to himſelf ſome performances of his new ſhip, as to ſwiftneſs, keeping a wind, ſtaying and ſteering, not ſtopping, *&c.* and he was deſired to give an extract of that letter.

Sir Anthony Morgan mentioned ſomething about the cuſtom of ſalmons returning into the ſame place of freſh water for ſpawning, of which he promiſed to give a farther account in writing.

Sir Robert Moray mentioned, that near Chertſey in Surrey a ſpring was diſcovered, on the water of which was found floating a certain oleaginous ſubſtance; ſome of which he was deſired to procure for the company.

The Torricellian experiment was made with water in a glaſs-cane about 40 foot long; and the water being fallen firſt to about 33 foot and within 18 minutes to about 32 foot, the operator was ordered to let it ſubſide till all the air be got out, and then to obſerve the height, at which the water ſtands; and then to fill the pipe up to the top with water freed from air.

Monſieur De Beaufort Vabres was propoſed candidate by Sir Robert Moray, and being a perſon of quality, and a foreigner, ready to go away, was at the ſame meeting elected and admitted a fellow of the ſociety.

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[d] Mr. Hooke, in a letter to Mr Boyle written this day, and publiſhed in Mr. Boyle's works, vol. v p. 532. obſerves, that ſuch an engine is taken notice of in Schottus's Mechanics, "whoſe "contrivance is continually to raiſe water by "turning round a cylinder with a ſliding-board "in it, included in another hollow cylinder or "barrel."

Sir EDWARD HARLEY was propoſed candidate by Sir ROBERT HARLEY in a letter, and ſignified to the ſociety by the lord viſcount BROUNCKER, preſident.

HENRY FORD, eſq; was propoſed candidate by Col. LONG.

July 20. At a meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER, preſident.	Dr. WILKINS.
Sir ROBERT MORAY.	Dr. GODDARD.
Mr. BRERETON.	Mr. PALMER.
Mr. BALLE.	Mr. OLDENBURG.

But there not being a *quorum* for the paſſing of ſtatutes, it was deferred till the next meeting.

July 22. At a meeting of the ſociety Sir EDWARD HARLEY and Mr. FORD were elected and admitted.

Sir JOHN TALBOT was propoſed candidate by the lord viſcount BROUNCKER, and EDWARD WATERHOUSE, eſq; by Dr. WILKINS.

Capt. TAYLOR gave in his obſervations on cider, which were read, and ordered to be regiſtered [e].

Mr. WINTHROP's letter written from Boſton to Mr. OLDENBURG was read, giving an account of the trials made by him at ſea with the inſtrument for ſounding of depths without a line, and with the veſſel for drawing water from the bottom of the ſea; both which proved ſucceſsleſs, the former by reaſon of too much wind at the time of making ſoundings; the latter, on account of the leaking of the veſſel. Capt. TAYLOR being to go ſoon to Virginia, and offering himſelf to make the ſame experiments, the ſociety recommended to him the trying of the one in calm weather, and of the other with a ſtanch veſſel.

Mr. HOOKE mentioning, that a better way might be ſuggeſted to make the experiment above-mentioned, was deſired to think farther upon it, and to bring in an account thereof at the next meeting.

Sir ROBERT MORAY produced ſome of the water of the ſpring diſcovered two miles from Chertſey, and gave this farther account of it, that it is clear, but covered almoſt all over with a thick oleaginous matter, which had neither taſte nor ſmell, while it lay upon the water, of a colour very near as red and a conſiſtence thicker than warm blood, as long as the ſun is high; but about the ſun's riſing and ſetting, of various colours; flowing ſo copiouſly, that it might be had in great quantities in a very ſhort time. Being for ſome hours expoſed to the heat of the ſun, it contracted a putrid ſmell, and ſome of the floating red matter precipitated to the bottom.

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[e] Original Regiſter, vol. ii p. 274.

Mr. Hooke was ordered to take a journey to Chertſey, at the charge of the ſociety, and to obſerve the ſaid ſpring, and to inform himſelf of all circumſtances concerning it, and alſo to diſtil ſome of it.

Mr. Brereton made mention of certain waters in Cheſhire, ſome of which are yellow, eſteemed to betoken coal-mines; and others red, held to be a ſign of iron-mines.

Capt. Taylor mentioned a ſpring in Shropſhire at Pitchford, on which floated a bituminous ſubſtance, which being taken off one day, the like will be found on it again the next.

Dr. Clarke related, that the Barnet waters, on a hot ſun ſhiny day, were found full of little inſects; which inſects, the water being ſtrained, remaining upon the cloth, turn into a jelly. He and Mr. Hooke were deſired to go to Barnet for a more particular account of this matter.

Dr. Goddard gave an account of the trials made of the ſand produced at the laſt meeting by Mr. Pell, *viz.* that having made a ſeparation by waſhing, ſome of it looked black, ſome cryſtalline, and two coppels being made of it, one of them, that was heated only red-hot, kept its ſtanding; but the other, being urged by a more intenſe heat, vitrified, and melted into a lump. Mr. Pell was deſired to ſend for more of this ſand, his friend having offered him the reſt of what he had thereof in his houſe.

Some of the ſociety rubbing a piece of the vitrified lump of this ſand, found it electrical.

Dr. Clarke being called upon for his trials of the injections into veins, promiſed to give them in a fortnight after.

Sir Robert Moray mentioned, that the king had made an experiment of keeping a ſturgeon in freſh water in St. James's Park for a whole year: it was moved to kill it, and to ſee how it would eat.

He related, that prince Rupert had made a new kind of gunpowder, in ſtrength ſo far exceeding the beſt Engliſh powder, that trial being made with a powder-trier, it was found to be in the proportion of 21 to 2. It was deſired, that a trial of it might be made before the ſociety; and that the account of the way of making it, formerly communicated, might be looked after, and regiſtered, which was done [f], as follows:

" The three ingredients of gunpowder, *viz.* ſaltpetre, brimſtone, and coal, muſt " be prepared each by itſelf; as followeth:

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[f] Original Regiſter, vol. ii. p. 283.

" Take of common ſaltpetre about fifty pounds, more or leſs, according as you " intend to make more or leſs powder; and put it into a very clean and well rubbed " copper-kettle, that is even every where, to the end that the ſaltpetre, after it is " purified and hardened again, may be brought whole out of the kettle. Then " pour upon this petre very clean limpid fountain-water, ſo that it may ſtand two " inches above it; and put it upon a trivet over a fire made of dry ſmall wood " till it melt; and when you ſee the upper part melted, thruſt a clean ſtick to the " bottom of the kettle, to know whether it be all melted or no. When it is " thoroughly melted, then let it boil up a matter of ten times, ſcumming away all " the dirt with a clean copper-ſcummer. After this put either the ſaltpetre from " the trivet into a cool place, or put the fire that is under it quickly away (the firſt " way is the better) and cover the kettle with ſome boards, and a double linen-" cloth very well, and ſo let it ſtand twenty-four hours, or ſo long till the ſaltpetre " ſhoot into cryſtals. Then put the kettle upon a bench, and inclining it, let " the water by little and little run off from the petre into another veſſel, till nothing " thereof be left in it; letting the kettle ſtand in this poſture half a day, till all " the water be quite dropt away from the petre. Then putting the kettle right " again, take the cryſtallized petre, as much as you can get looſe with your hands, " and put it into a very clean wooden trough, and then turn the kettle upſide " down upon a table covered with a clean cloth, and ſhake it till all the petre fall " out; and with a great ſharp knife ſcrape well away all the dirty ſediment from " the bottom. Then beat off the petre the upper part, as far as to a hand's height " from its bottom, into pieces, and put them with the gathered cryſtals upon a " dry clean table, and with a wooden mallet beat all this pretty ſmall, and then " expoſe it to the ſun, or put it in a ſtove in winter, ſtirring it ſometimes till the " ſaltpetre grow altogether dry again. Then take again a copper-kettle, but not " altogether ſo big as the former, yet very ſtrong, it being to endure a great heat; " ſomewhat narrower toward the bottom than at the top, that the ſaltpetre may " the eaſier be gotten out of it. This kettle being put over a good ſmith-coal fire, " fill it brimfull of the purified ſaltpetre, and let it melt, and ſtir it with a ſtick " to the bottom as before: this melting, till it be complete, will require a great " deal of time and exerciſe of patience. And though the ſaid ſtick, by the ſtir-" ring at the bottom and every where in the kettle, ſhould take fire, it were no " matter, and you need not fear; but rather, if the fire decay, put under more " coals, until the ſaltpetre be melted into a clear liquor, which, though it look " black at top, yet is within pure and clean.

" Then take ſmall beaten brimſtone ſifted through a hair-ſieve, and with your " two fore-fingers ſcatter it very thin every where on the ſurface of the melted ſalt-" petre; and this will, by a flame, conſume all the impurity that is there, repeating " it ſome three times quickly one after another. The ſaltpetre being thus made " thoroughly pure and quick, put away the fire from under it, or, as afore, remove " it from the fire into a cool place, covering it well, until it grow cold and hard. " Then turn the veſſel upſide down upon a clean table, that the ſaltpetre may fall " out of it; and not falling at the firſt knock, you muſt knock it ſeveral times, " and it will come out like a tallow-cake, which muſt be ſcraped clean at the bot-" tom: then with an iron-hammer beat the ſaltpetre into ſome great pieces, and

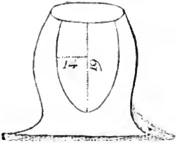
“ put theſe into a great mortar, and pound them as ſmall as flour, and ſift it through a clean hair-ſieve, which hath two leather bottoms, that nothing may fly away in duſt. The groſſer parts, that will not paſs through the ſieve, muſt be beaten till they all paſs, and then keep all in a trough apart; which is the preparation of ſaltpetre for gunpowder.

“ The ſecond ingredient is brimſtone, which you muſt chooſe fine and yellow, and very pure; which, if preſſed cloſe within the hollow of your hand, and put to the ear, will make a cracking noiſe, and thereby diſcover its goodneſs. This muſt be beaten in a mortar (like as the ſaltpetre was) into a flour, and ſifted alſo through ſuch a ſieve, and kept likewiſe in a veſſel apart.

“ The third ingredient is coal; which to make, you muſt look in buſhes and hedges for a kind of wood called *ſpina cervina*, which hath black berries and a grey rind, and leaves not unlike common cherry-leaves; much uſed by coopers for taps, having within, when cloven, a red ſtar. Theſe you muſt cut off at the bottom, chooſing ſuch as are ſtrait without knots, and of an inch in thickneſs, not much bigger, for fine powder. It is better than any other wood whatſoever for this purpoſe, and it yields a dry and clear-ſounding coal, which keepeth the powder very dry and good, and from growing ſoft or mealy, or duſty by the weather; and maketh it catch fire very eaſily. Having a good quantity of this wood, cut away knots, tops and twigs; peel away all the outward and the green rind from the top to the bottom, and ſcrape it all over till you ſee it white every where, and then bind them together into faggots, expoſing them to the ſun or air to dry very well; which they will do better, if looſened again after they are carried abroad; hen cut them with a ſmall hatchet into pieces of about a foot and a half long, and cleave them in the middle, and that piece, which is too thick, cleave again, that they may be all of the ſame ſize, and burn out all together into coals; for if one be thicker than the other, the thicker will burn out ſlower than the other; and before it turn to coal, the thinner may be half turned to aſhes. You will do well to put this wood croſs-wiſe, round about in a chimney or hearth, two or three foot high, one above another; and have a care leſt your hearth be broken, that no earth and ſtones may mingle under the coals. Then kindle the wood, and when it begins to coal, throw the ends of it into the fire alſo, that all may be burned together. All being turned to coals, turn them every where with a ſtick, to ſee whether none of them do ſmoak, which muſt be quickly burned thoroughly, or caſt away. Then put theſe coals into a new great earthen veſſel, ready at hand, and cover them immediately with a wooden or iron cover, and they will go out preſently: thus you may burn as much as you need. Theſe coals put into a ſearcer that hath holes of the ſize that a pea may fall through, and ſift away the duſt and aſhes, and look very carefully, that there be no dirt or filth among them, which throw away. Then beat them in a convenient mortar to powder as fine as flour, and ſift them through the narrow hair-ſieve, and keep them alſo by themſelves, as the reſt.

“ Follows the doſe, how much of each ingredient muſt be taken into the compoſition.

" For this purpoſe you muſt have ready a very juſt balance, with two pretty big copper ſcales, and a pile of weights; and then ſee how big your ſtamping-mortar is, if you mean to work your powder with your hands; or the wooden trough of a powder-mill, wherein it is to be pounded; for accordingly you may order your doſe, that ſo you may not do too much nor too little; and that the powder may be wrought enough, *e. g.* If the trough of the powder-mill have about nineteen inches in depth, and fourteen inches in the midſt, where it is largeſt (for to be of a right ſhape and proportion, as it ought, it muſt be oval, after the manner in the figure) the powder falling from the top, whither it went up by all the ſides, handſomely down again into the midſt under the peſtles, it will be well wrought. And theſe being well made, and wholly caſt of materials for braſs-guns, are the beſt; though I have uſed to two powder-mills ſuch as were caſt of iron, which were good (being neatly caſt). If the trough, I ſay, be of this bigneſs, then you may very well weigh together a doſe of about ſeven pounds and an half, putting in one of the ſcales ſix pounds of ſaltpetre, and twelve ounces of brimſtone, and fifteen ounces of coals; ſo that I reckon to each pound of ſaltpetre two ounces of brimſtone, and two ounces and an half of coals. After this pour ſuch a doſe into a great trough, and with your hands mingle it together gently; having firſt ſpread it thin all over the bottom of the veſſel, or upon a table: and then with a clean black bruſh, dipt into very pure and clear water, ſprinkle it; yet not too much at firſt, for fear of making it too moiſt; and work it well with your hands, till it ſomewhat yield to rolling; the more you work it the better it will be, ſprinkling it now and then with water, till it be wrough enought, and neither too dry nor too moiſt. Then put the doſe into your mortar or mill-trough, and let it be pounded two hours; and then take it out with a flat copper ſhovel, and put it into the trough: and there remaining ſometimes at the bottom a part of the doſe as hard almoſt as a ſtone, you muſt with a fit braſs inſtrument labour to work it out; and having crumbled it into as ſmall pieces as may be, mingle it very well with the reſt; and if it be ſo dry as to duſt in the pounding, you are to moiſten it as afore.



" This working or pounding muſt be continued for ſixteen or ſeventeen hours; yet ſo as to take out the doſe every two hours. This time being paſſed, ſave half an hour, take out the doſe once more, and moiſten it for *corning*, but ſomewhat more than afore, to the end that being put in again to be pounded half an hour longer, it may handſomely ſtick together in little lumps of the bigneſs of a pea or bean, or ſomewhat bigger, ſo that it may not duſt; yet be careful, that you moiſten it not too much, but obſerve a medium as much as is poſſible.

" After this you take out all for corning, and having ready a corning-table ſo made, that you may draw it downwards before, having in its middle two wooden

" ſtaves overthwart, upon which the corning-ſieves may go to and fro, you muſt " alſo have ready four ſearcers, the firſt with holes about the bigneſs of a pea, " and the other three with ſuch as are ſtill leſſer than the other; ſo that the laſt " may juſt fit the ſize of the powder deſired. Then pour one half part of the " doſe into the biggeſt of theſe ſieves, put upon the ſtaves of the corning-table, " moving it forward, backward, and round; and what will not paſs, you muſt " gently preſs with your flat hand; and having thus made the little lumps leſſer, " ſift them again. And if any of it yet remain, that is ſo hard and big as not to " paſs, uſe a wooden trencher, of a ſmall inch thickneſs in the midſt, with a " wooden peg in it of a finger's length, and therewith break it by preſſing on it, " whilſt you ſhake the ſieve up and down. With the other half part proceed in " the ſame manner. All being paſſed through the wide ſieve, put your veſſel " upon the ground under the corning-table, and draw the table downward, to let " the ſifted powder run into the veſſel, ſweeping with a bruſh into it what will not " run down. Then dreſs your table right again, and with the other three leſſer " ſieves, according as they gradually differ in their holes, ſift the powder over and " over again, as afore; and if you ſift it twice in the narrow ſieve, it will be the " better. After all this take a hair-ſieve, and ſift in it your powder in three par- " cels, to the end that the duſt may fall upon the table; and what remains in the " ſieve pour upon a dry table, and expoſe it to the ſun, or in a warm ſtove to dry.

" It will fall out ſometimes, that the moiſt powder in the ſifting will ſtick with- " in the ſieve-holes; which when it does, take a little twig, and with it beat on the " bottom of the ſieve (after you have firſt put the other powder on one ſide) and " then it will paſs through. Have alſo a care not to touch your powder with un- " clean hands, becauſe it weakens it.

" The powder being altogether dry, put it again in two parcels into a hair-ſieve, " and ſift the duſt out of it upon the table, and add it unto the other duſt ſifted " out afore, and moiſten this again for corning, as hath been taught above, letting " it firſt be ſtamped about an hour in the mortar or mill-trough, and then being " corned, after the manner already mentioned, you have prepared your powder as " it ought to be.

" Becauſe this powder is pretty ſtrong, you muſt make your charges ſomewhat " leſs in all ſmall guns, and eſpecially in piſtols, for elſe they will break.

" F. M. Z. B."

Mr. Brereton mentioned, that he had been informed at the Tower about four or five years ſince, that there was then there ſome of the gunpowder of 1588 much better than any now made. He added, that he knew not whether the way of making, or the care of keeping it, cauſed the difference.

Prince Rupert's water-raiſing engine after the method of Cavallerius's *hydrocontiſterium novum*, was ordered to be tried; and a deſcription of it was given in by Mr. Hooke, which was ordered to be regiſtered[g], as follows:

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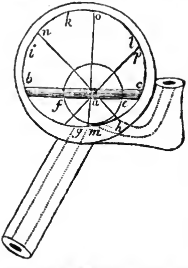
[g] Original Regiſter, vol. ii. p. 281.

" It



"It conſiſts of three parts.

1. "A hollow cylinder *i*, *k*, *l*, *b*, *g*, which "cavity is not perfectly round; but of ſuch "a figure, that all the diameters drawn "through the point *a* (which is out of the "middle) are equal.

2. "Of a ſolid ſmaller cylinder, *e*, *f*, *d*; "perfectly round, which is ſo placed with "the hollow of the former, that one ſide "of it doth always touch the concave cy"linder in the point *m*.

3. "Of a ſliding valve or board, *b*, *a*, *c*; "which being equal to the diameter of the "figure, always toucheth oppoſite ſides of "the concave cylinder; and as the ſmaller "cylinder is moved round within the hol"low one, the valve is made to ſlip to and "fro in a groove or mortiſe made fit for "it, through the middle of the ſmaller cylinder; both ends of which cylinder "paſſing through adapted holes in the ends of the ſmaller cylinder, have handles "faſtened to them, by which the cylinder is turned about from *f*, by *d*, to *e*; by "which means the end of the valve *b*, is moved by *n*, *o*, *l*, *c*, *&c.* By this cir"cumſtance of the cylinder and valve, the water is always drawn in by the hole *g*, "which is behind the valve; and caſt out by the hole *b*, which is before it."

Dr. CHARLETON undertook to cut out the ſpleen of a dog at the next meeting; as alſo to ſend for a dog out of the country, whoſe ſpleen had been cut out about four or five years before, in order to open him again, and to obſerve the preſent conſtitution of thoſe parts.

The operator was ordered to provide a young dog againſt the next meeting.

Dr. CHARLETON was deſired to bring, in writing, his account of the obſervations of the diſſection of the carps, made by him at this meeting.

The operator was ordered to proſecute the experiment of Monſ. HUYGENS in the longer glaſs canes; as alſo the Torricellian experiment in the tube of 40 foot.

June 27. At a meeting of the COUNCIL were preſent,

The lord viſcount BROUNCKER, preſident.	Mr. BALLE.
Sir ROBERT MORAY.	Dr. WILKINS.
Mr. BRERETON.	Dr. GODDARD.
Mr. AERSKINE.	Mr. PALMER.
Mr. HENSHAW.	Mr. HILL.
	Mr. OLDENBURG.

The preſident, at the deſire of the council, charged himſelf with the ſurvey of the treaſurer's accounts.

It was voted the ſecond time, that in the ſtatute for making laws, between the words *ſhall be* and *whether*, be inſerted, in both places, theſe words, *to this effect, videlicet*.

The ſtatute for weekly payments paſſed the ſecond time, as it ſtands recorded July 13, 1663.

The 2d, 3d, 4th, and 5th ſtatutes of the 4th chapter, concerning the ordinary meetings of the ſociety; and the 1ſt, 2d, 3d, 4h, 5th, 6th, and 7th ſtatues of the 6th chapter, concerning the election and admiſſion of fellows, paſſed the firſt time.

July 29. At a meeting of the Society, Sir John Talbot and Mr. Waterhouse were elected.

Mr. Hooke produced ſeveral figures, both for ſounding-inſtruments without a line, and for veſſels to fetch up water from the bottom of the ſea. He was deſired to give an explanation of theſe figures in writing; and the operator was ordered to make two models againſt the next meeting, one of the ſounding inſtrument, and another of the water-drawing veſſel, each after the draught of the firſt figure of each kind.

The operator gave an account of the obſervations made of the Torricellian experiment in the long tube, and particularly of its riſing and falling according to the weather; and he was ordered to continue his obſervations, and to put them all in writing.

He was directed alſo to exhauſt the air out of the tube for making of Monſ. Huygens's experiment at the next meeting.

Mr. Hooke was ordered to apply Mr. Boyle's engine to the long tube for the Torricellian experiment, to ſee whether the air could be thence exhauſted; and whether, thereupon, the water would ſubſide at all.

Mr. Graunt read two letters from Sir William Petty, concerning the ſucceſs of his new ſhip in its ſailing to Holyhead; and was deſired to give an extract of thoſe letters to be regiſtered.

Dr. Clarke produced two cocoa-nuts, which ſeemed to be outwardly petrified.

Mr. Hooke was put in mind of going to ſee the ſpring near Chertſey; as alſo, of aſſiſting Dr. Charleton, in drawing a ſcheme of the carp or ſalmon, which he was to diſſect, in order to ſhew the duct from the bladder to the gills of the fiſh.

Dr. Ent, upon mention made concerning the inſects found in Barnet-waters, ſuggeſted, that they are found there only in Auguſt.

Dr. Charleton cut the ſpleen out of a dog of about a year old, the dog ſurviving; upon which occaſion it was related, that Fioravanti, the Italian writer, in one of his Italian books, ſays, that the ſame had been practiſed ſucceſsfully upon a lady much troubled with ſplenetic diſtempers; ſhe outliving the loſs of her ſpleen many years.

The following were ordered for the next meeting.

1. The continuation of the Torricellian experiment in the long tube.

2. That of Monſ. Huygens, to keep the water ſuſpended after the exſuction of all the air.

3. Some experiment or other in the compreſſing engine.

The day following, *July* 30, Dr. Wren wrote from Oxford a letter to the preſident, concerning the experiments proper for his majeſty's reception[a].

“ My Lord,

“ The act and noiſe of Oxford being over, I retired to myſelf as ſpeedily as I
“ could, to obey your lordſhip, and contribute ſomething to the collection of ex-
“ periments deſigned by the ſociety for his majeſty's reception. I concluded on
“ ſomething I thought moſt ſuitable for ſuch an occaſion; but the ſtupidity of our
“ artiſts here makes the apparatus ſo tedious, that I foreſee I ſhall not be able to
“ bring it to any thing e'er I am neceſſitated to take a journey, which I am un-
“ avoidably tied to. What in the mean time to ſuggeſt to your lordſhip I cannot
“ gueſs. The ſolemnity of the occaſion, and my ſolicitude for the honour of the
“ ſociety, make me think nothing proper, nothing remarkable enough. It is
“ not every year will produce ſuch a maſter experiment as the Torricellian, and
“ ſo fruitful as that is of new experiments; and therefore the ſociety hath deſerv-
“ edly ſpent much time upon that and its offſpring. And if you have any notable
“ experiment, that may appear to open new light into the principles of philoſo-
“ phy, nothing would better beſeem the pretenſions of the ſociety; though poſ-
“ ſibly ſuch would be too jejune for this purpoſe, in which there ought to be
“ ſomething of pomp. On the other ſide, to produce knacks only, and things to
“ raiſe wonder, ſuch as Kircher, Schottus, and even jugglers abound with, will
“ ſcarce become the gravity of the occaſion. It muſt therefore be ſomething be-
“ tween both, luciferous in philoſophy, and yet whoſe uſe and advantage is obvious
“ without a lecture; and beſides, that may ſurpriſe with ſome unexpected effect,
“ and be commenable for the ingenuity of the contrivance. Half a dozen of ex-
“ periments thus qualified will be abundantly enough for an hour's entertainment;
“ and I cannot believe the ſociety can want them, if they look back into their own

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[a] Letter-book, vol. i. p. 97.

" ſtore. For myſelf, I muſt profeſs freely, I have not any thing by me ſuitable
" to the idea I have of what ought to be performed upon this occaſion. Geo-
" metrical problems and new lines, new methods (how uſeful ſoever) will be but
" taſteleſs in a tranſient ſhew. New theories, or obſervations, or aſtronomical in-
" ſtruments (either for obſervation or facilitation of the calculi) are valuable to
" ſuch artiſts only, who have particularly experimented the defects, that theſe things
" pretend to ſupply. Sciographical knacks (of which an hundred ſorts may be
" given) are ſo eaſy in the invention, that now they are cheap. Scenographical,
" catoptrical, and dioptrical tricks require excellent painting, as well as geo-
" metrical truth in the profile, or elſe they deceive not. Deſigns of engines for
" eaſe of labour, or promoting any thing in agriculture, or the mechanic trades,
" I have occaſionally thought upon divers, but they are not intelligible without
" letters and references, and often not without demonſtration. Deſigns in archi-
" tecture are only conſiderable as they are appropriated to ſome work in hand,
" or elſe, as they are a kind of criticiſm and ſearch into antiquity. In navigation,
" it will be preſumptuous to proffer at any thing, while we expect from your lord-
" ſhip an accurate theory, from the times of Noah unknown, and reſerved for your
" lordſhip, a ſecond great endeavour of human nature. The needle had poſſibly
" more of chance than invention; yet that gave us a new world. This will be
" the product of reaſon and philoſophy, and may give us the undiſcovered parts
" of our globe. In the few chemical experiments I have been acquainted with,
" I cannot tell whether there will be any, that will not prove too dirty or tedious
" for an entertainment. Experiments of anatomy, though of the moſt value for
" their uſe, are ſordid and noiſome to all, but thoſe whoſe deſire of knowledge
" perſuadeth them to digeſt them. Experiments for the eſtabliſhment of natural
" philoſophy are ſeldom pompous. It is upon billiards and tennis-balls, upon
" the purling of ſticks and tops, upon a vial of water, or a wedge of glaſs, that
" the great DES CARTES hath built the moſt refined accurate theories, that human
" wit ever reached to; and certainly nature, in the beſt of her works, is apparent
" enough by obvious things, were they but curiouſly obſerved. The key, that
" opens treaſures is often plain and ruſty; but unleſs it be gilt, the key alone will
" make no ſhew at court.

" If I have been converſant in philoſophical things, it hath been principally in
" theſe ways, which I have recounted to your lordſhip, by which your lordſhip
" perceiveth how uſeleſs I am for this occaſion. Yet if your lordſhip will ſtill
" purſue me, I know not what ſhift to make, but to retire back to ſomething I
" have formerly produced or diſcourſed of.

" I have pleaſed myſelf not a little with the play of the weather-wheel (the only
" true way to meaſure expanſions of the air) and I fancy it muſt needs give others
" ſatisfaction, if it were once firmly made, which I ſuppoſe may be done, if the
" circular pipe, which cannot truly be blown in glaſs, were made of braſs, by
" thoſe, who make trumpets and ſackbuts (who wire-draw their pipes through a
" hole and equal them, and then filling them with melted lead, turn them round
" into what flexures they pleaſe) but the inſide of the pipe muſt be varniſhed with
" china-varniſh (which GRATERIX hath) to preſerve it from the quickſilver, and

“ the glaſſes muſt be fixed to the pipe with varniſh, which I take to be the beſt cement in the world; for thus the Chineſe fix glaſs and mother of pearl in their work. It would be no unpleaſing ſpectacle, to ſee a man live without new air as long as you pleaſe. A deſcription for cooling and percolating the air at once I formerly ſhewed the ſociety, and left with Mr. Boyle: I ſuppoſe it worth putting in practice. You will at leaſt learn thus much from it, that ſomething elſe in air is requiſite for life, than that it ſhould be cool only, and free from the fuliginous vapours and moiſture it was infected with in expiration; for all theſe will, in probability, be ſeparated in the circulation of the breath in the engine. If nitrous fumes be found requiſite (as I ſuſpect) ways may perhaps be found to ſupply that too, by placing ſome benign chemical ſpirits, that by fuming may impregnate the air within the veſſel. If an artificial eye were truly and dioptrically made (which I would have at leaſt three inches diameter) it would repreſent the picture as nature points it. The cornea and cryſtalline muſt be glaſs, the other humours water. I once ſurveyed an horſe's eye as exactly as I could, meaſuring what the diameters of the ſeveral ſpheres of the humours were, and what the proportions of the diſtances of the centers of every ſpherical ſuperficies was upon the axis of the eye. The ways, by which I did it, are too long to rehearſe; but the projection in triple the magnitude Sir Paul Neile may poſſibly find out: or, if your lordſhip think it worth while, I ſhall reiterate the experiment.

“ A needle, that would play in a coach, will be as needful to know the coaſt and way (joined with the way-wiſer) as a pleaſant diverſion to the traveller; and would be an acceptable preſent to his majeſty, who might thus, as it were, ſail by land. The fabric of it may be ſuch as this: in a ſphere of glaſs of two inches diameter, half full of water, cauſe a ſhort broad heavy needle to ſwim, being buoyed up by the chart, and both varniſhed. Inſtead of a cap and a pin, let the perforated needle play about a ſmall wire or horſe-hair, extended like a perpendicular axis in the glaſs ſphere; which being made weighty with lead, fixed to the nadir, and an horizon as it were cemented to it, let it play in circles, like the vulgar compaſs. Then let an hemiſpherical concave box, containing the ſphere in its circle, be hung upon ſprings after this manner: ſuppoſe a baſis, upon which are erected perpendicularly three ſtiff wooden ſprings of yew; from the ends of which ſprings are ſtrings or nerves ſtrained, forming an equilateral triangle, the middle of whoſe ſides paſs through three ſmall loops on the brim of the concave, which therefore hanging on the luteſtrings, repreſents a circle inſcribed in a triangle: from the middle of the baſis ariſeth a worm-ſpring, faſtened by a ſpring to the nadir of the concave, drawing it down a little, and acting aginſt the other three ſprings. Thus I ſuppoſe the ſprings will take off much of the lateral and perpendicular concuſſions; the circles will take off oſcillations; the agitations remaining will be ſpent in the water, and ſtilled by the chart covering the ſuperficies of the water; for thus we ſee, a trencher ſwimming in a bucket keeps the water from ſpilling in the carriage. And the Chineſe, inſtead of circles, have their compaſs ſwimming in water. Laſtly. I would have all the bottom of the baſis, near the edge, made like a bruſh, but with ſoft, thick, and inclining briſtles, which will eaſe it like a thou-

" ſand ſprings. It ſhould be placed on the middle of the floor of the coach, where
" by opening a window, you may likewiſe ſee the way-wiſer placed on the perch.

" My Lord, if my firſt deſign had been perfect, I had not troubled your lordſhip " with ſo much ſcrible, but with ſomething performed and done; but being taken " off by my occaſions, I had rather be impertinent than diſobedient, and am fain " in this letter to do like the common chemiſt, who, when projection (his fugitive " darling) hath left him thread-bare, is fain to fall to vulgar preparations to " pay his debts. And I muſt needs acknowledge, I am not only indebted to the " ſociety, but moſt part to your lordſhip, to whom I owe a double duty, both as to " our preſident, and to my very good lord and patron."

Auguſt 3. At the meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER, preſident.
Mr. BRERETON.
Sir ROBERT MORAY.
Mr. AERSKINE.
Mr. BALLE.
Dr. WILKINS.
Dr. GODDARD.
Mr. PALMER.
Mr. OLDENBURG.

The preſident acquainted the council, that Sir GILBERT TALBOT[i] had ſent to him, without taking any fees, the mace beſtowed by his majeſty upon the ſociety; and that himſelf, the preſident, had in the book of his majeſty's jewel-houſe acknowledged the receit thereof for the ſociety. Whereupon it was ordered, that Sir GILBERT TALBOT ſhould have the thanks of the ſociety, which the preſident was deſired to give him: And

It was reſolved, that the clerk and the operator be mace-bearers *pro tempore*.

It was ordered, that the lord viſcount BROUNCKER, Dr. WILKINS, Dr. GODDARD, Mr. PALMER, Mr. HILL, and Mr. OLDENBURG, meet on the Monday following, about two of the clock, in Dr. GODDARD's chamber[k], to examine the accounts of the treaſurer.

The 2d, 3d, 4th, and 5th ſtatutes of the 4th chapter, and the 1ſt, 2d, 3d, 4th, 5th, 6th, and 7th ſtatutes of the 6th chapter be paſſed the ſecond time.

Auguſt 5. At the meeting of the SOCIETY Mr. WATERHOUSE was admitted; and the lord ASHLEY was propoſed by the lord viſcount BROUNCKER, and elected the ſame day, according to the privilege of noblemen.

Sir GILBERT TALBOT received the thanks of the ſociety for ſending them the mace, which his majeſty had given them, without taking any fees.

Dr. FAIRCLOUGH was, at the motion of Dr. GODDARD, permitted to be preſent at this meeting, and ſhewed a certain ſtone (pretended to be an oriental bezoar) of

[i] Maſter of the jewel-office.

[k] In Greſham-College.

the weight of twenty ounces and an half; but being rubbed upon fair white paper (according to Dr. Gliſſon's ſuggeſtion) left no greenneſs upon it. He was deſired to produce this ſtone again at the next meeting, that it might be looked upon with a microſcope, which Mr. Hooke was ordered to bring with him for that purpoſe.

Mr. Hooke produced three microſcopical obſervations, 1. Of the honey-comb-ſea-weed. 2. Of the teeth of a ſnail. 3. Of roſe-leaves, having, at the ſeaſon of the year, when they are withering, a certain plant growing on the back of them.

Sir Robert Moray produced again the ſtones taken out of the earl of Belcarres's heart, and deſired, that the figure of them might be drawn; and Dr. Wilkins moved, that it might be taken in plaiſter: the care of both which was committed to Mr. Hooke.

This gave occaſion of ſpeaking concerning the ſtone in the kidneys; upon which Dr. Wilkins moved, that trial might be made upon a dog, whether the ſtones of the kidneys might be cut out with any ſucceſs; and Sir Robert Moray ſuggeſted, that this experiment deſerved to be tried the rather, becauſe old dogs are ſaid to die commonly of that diſtemper; and that himſelf had found a very old dog, being diſſected, full of gravel in the kidneys. Though this operation was thought very difficult by Dr. Gliſſon, Dr. Goddard, Dr. Quatremaine, and Dr. Charleton, by reaſon of the ſituation of the kidneys lying ſo deep in the body, and of the great effuſion of blood conſequent upon the opening, and of the danger in wounding the ureter; it being alſo very uncertain to hit the ſide, on which the ſtone lies; yet notwithſtanding theſe difficulties, Dr. Charleton was deſired to try this experiment at the next meeting upon a dog, which the operator was directed to provide for that purpoſe, in order at leaſt to ſee, whether a wound in the kidneys be curable.

Sir Robert Moray related, that more trials had been made of prince Rupert's gunpowder, which he formerly mentioned to have above ten times the force of other powder. Theſe trials, he ſaid, had been, that whereas thirty grains of this powder raiſed a weight to a great height, half that quantity, with a little ferrel put looſe in the powder-trier raiſed the ſame weight to a greater height than the whole did: but this moiety with the ferrel fixed in the ſame trier did not raiſe it ſo high as the whole would do.

Mr. Hooke was appointed to conſider of a way to determine the ſtrength of powder by weight.

Dr. Wilkins was deſired to give directions for the lifting up of fifty pounds weight by one grain of *aurum fulminans*.

Sir Robert Moray was deſired to get two hollow iron-balls made for the putting of gunpowder into one, and *aurum fulminans* into the other; and to make them red-hot, in order to ſee, whether the gunpowder would melt in one, and the *aurum fulminans* fire in the other.

He and Mr. BOYLE affirmed, that the *aurum fulminans* being fired might be recovered.

Auguſt 10. This council-day nothing was done for want of company.

Auguſt 12. The preſident and his deputy[l] being abſent this day, there was no meeting of the ſociety.

Auguſt 17. At the meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER,
preſident.
Mr. BRERETON.
Mr. BOYLE.
Sir ROBERT MORAY.
Mr. AERSKINE.
Mr. SLINGESBY.
Mr. HENSHAW.
Mr. BALLE.
Dr. WILKINS.
Dr. GODDARD.
Mr. PALMER.
Mr. HILL.
Mr. OLDENBURG.

Mr. PALMER was deſired to inquire of ſome lawyers, whether more at a time than one vice-preſident of the ſociety could be ſworn.

The 1ſt, 3d, 4th, and 5th ſtatutes of the 3d chapter, and the 1ſt, 2d, 3d, and 4th ſtatutes of the 8th chapter paſſed the firſt time.

It was ordered, that a ſtatute ſhould be made, that the preſident ſhould not preſide in any council or committee tranſacting any buſineſs, wherein he is a party.

Mr. ASHMOLE preſented the ſociety with a picture of their arms.

Auguſt 19. Sir JOHN PETTUS, RALPH BATHURST, M. D. and Mr. JOHN BEAL were elected; and Dr. BATHURST being preſent was admitted.

Capt. SILAS TAYLOR preſented the ſociety with his *Hiſtory of gavelkind* lately printed[m]; for which he received their thanks, and the book was recommended to Dr. GODDARD's cuſtody.

Mr. WATERHOUSE preſented the ſociety with a manuſcript atteſted by a public notary of Amſterdam, containing the relation of an accidental bezoar of an extraordinary ſize, weighing near ſeven pounds, and having been formerly tried at Amſterdam (where a certain citizen was poſſeſſor of it) by ſeveral phyſicians, apothecaries, and druggiſts of the ſaid city, to be a true natural bezoar. This paper was ordered to be filed up.

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[l] Dr. WILKINS.

[m] At London 1663, in 4to.

Dr. ENT ſuggeſting, that a true natural bezoar put into water would have the ſame weight, when weighed afterwards, with what it had before; the oriental bezoar produced by Dr. FAIRCLOUGH, of twenty ounces and an half, was weighed, and then dipt in water, and found to weigh afterwards three quarters of a grain leſs than before.

Mr. GRAUNT brought in his account of the multiplication and growth of carps and ſalmons; which was ordered to be regiſtered [n], as follows:.

" A pond new digged at Deptford for horſes and other cattle to water in the " year 1658, two male and two female carps being then put in, with intention " to breed; in the year 1662 the pond being tainted with fiſh, ſo that the cattle " refuſed to drink, there were then taken out of this pond eight hundred ſeventy " and odd carps, of about nine inches in length, ſome more, ſome leſs; a great " number of ſmaller fiſh being left for breeders.

" And in the Severne and elſewhere it hath been experimented, by faſtening " of ſmall pieces of fine tape or ſilk through the gills of young ſalmon, that in two " years they have advanced to near three foot in length."

Dr. CLARKE was deſired to bring in his experiments of injection, as they were then; and to make an addition hereafter of thoſe, which he ſhould try farther.

Mr. HOOKE gave in a picture of the ſtones taken out of the heart of the earl of BALCARRES [o].

The lord viſcount BROUNCKER promiſed to get the ſame done in plaiſter.

Mr. HOOKE produced his microſcopical obſervation of a long-legged ſpider, having two eyes fixed on its back, and ſtanding out upon a ſtem.

The operator produced ſome rain-water with a great number of little inſects in it. Mr. HOOKE was ordered to look upon them with a microſcope, and to draw the picture of them. The operator was directed to keep theſe inſects, in order to ſee, whether they would turn into any other kind; and likewiſe to procure and keep ſome Barnet-water, which breeds worms, chiefly in Auguſt.

Mr. HENSHAW related, upon this occaſion, that having kept once ſome dew in a glaſs, he found worms breed in it; and leaving it in his ſtudy ſhut cloſe for ſome weeks, whilſt he was in the country, found at his return the ſtudy ſwarming with gnats, which he thought to have been produced by theſe worms; and that he was confirmed in this opinion, by finding the ſurface of the water full of little ſkins or bags; from which he conceived that the gnats had crept out, ſince himſelf ſaw one of them creep out and fly away.

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[n] Original Regiſter, vol. ii. p. 289. [o] Ibid. p. 290.

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The experiments were tried of cloſing up ſome gunpowder and ſome *aurum fulminans* into two ſeveral iron-balls, and of putting them in the fire; whereof that with the gundpowder fired and burſt; but that with the gold-powder not at all; but being cut aſunder, the powder thereof was found ſticking to the ſides within, and with *aqua regis* reduced to gold; of both which Dr. Goddard was deſired to bring a full account in writing.

It was agreed to deſire Sir Robert Moray to procure ſtronger balls to be made of this kind, to promote the experiment; and that the balls ſhould be made of one ſolid piece thicker than the former, with a hole drilled into each of them, and the male ſcrew very exactly fitted to the female-ſcrew.

Mr. Hooke ſhewed the figure of an engine for determining the force of powder by weight; and was deſired to draw it again, and to add ſome explication to it.

The lord viſcount Brouncker was deſired to conſider of the powder-trials made by prince Rupert, wherein eleven grains of powder put into a trier with a looſe ferrel, raiſed a weight higher than as much more doth with a ferrel fixed.

Dr. Wilkins was deſired to provide againſt the next meeting things neceſſary for the lifting up of fifty pounds weight with one grain of *aurum fulminans*.

Monſieur Huygens's experiment was tried again, and ſucceeded; the water, which was well purged of air, remaining faſtened in a cane of near ſeven foot, after the engine was very well exhauſted.

It was ordered to be tried again, and Mr. Hooke was deſired to continue the application of a ſucker to it; and to take an exact notice of all the circumſtances occuring in this experiment, and to to give all in writing.

Auguſt 24. At the Council were preſent

Mr. Boyle.
Mr. Balle.
Dr. Wilkins.
Dr. Goddard.
Mr. Palmer.
Mr. Hill.
Mr. Oldenburg.

The treaſurer's accounts were begun to be examined, both as to the payments made by the fellows to him, and the bills of payments made by him for the uſe of the ſociety.

Mr. Balle offered the following experiments for his majeſty's reception:

1. Of the two marbles.
2. Of making a conſiſtent ſubſtance of ſpirit of wine and another liquor.
3. Of making two liquors ſmoke by approach.

4. Of turning a greeniſh opake liquor partly into a tranſparent red, and partly into a whitiſh ſubſtance, by the affuſions of a clear liquor.

5. Of ſinking a ſubſtance in a glaſs by pouring in more water.

6. Of the aſcenſion of water upon ſuction.

Auguſt 26. At at meeting of the Society a Latin letter of Dr. Eccard Leichner, of Erfurt in Germany, to the ſociety, dated the 16th of April 1663[p], relating to a printed book of his ſent by him to his majeſty, concerning the deſign of reducing all ſciences, and divinity itſelf, into order by an apodictical method, and deſiring the opinion of the ſociety in this matter, was read, and referred to the conſideration of Dr. Wilkins, Dr. Wallis, Mr. Pell, and Mr. Hooke, to make a report thereof to the council, and to draw up ſomething by way of anſwer to it.

Dr. Goddard brought in writing an account of the two experiments made at the laſt meeting with gunpowder and *aurum fulminans* in iron balls; which was read, and ordered to be regiſtered[q]. He was deſired to prepare more *aurum fulminans* for the proſecution of theſe experiments.

Mr. Colwall gave in an account which he had received in a letter from the governor of St. Helena, dated there April 30, 1663, concerning the tides, winds, ſprings, ſpouts, and weather there; which account was ordered to be regiſtered[r], and was as follows:

> "The tides here, which are at full and change about two of the clock, riſe not above four foot and an half: they ſeem to come on both ſides of the iſland to us, in Chapel-valley, which reſpects only north and weſt, which is always to leeward, the wind blowing conſtantly all the year about eaſt-ſouth-eaſt. The tides never come ſo high as our river, which indeed is but a ſmall brook, that a man may ſtep over, by reaſon of the high beach near the ſea. The ſprings are all aloft, and flow almoſt every way from the middle, which is the higheſt part of the iſland, in little, narrow, and deep rills and guts; and ſo diſperſe themſelves to moſt quarters of the iſland. But no ſpring-head, nor any wood, within two miles of the ſea round. We have for the firſt three years had ſome ſcarcity of rain; but the laſt year, ſo much as hath done extreme damage, not only to our fruits above (for there is no good grounds below) but endangered all our fortifications: the fort called Greenwich was one half borne down with the floods; and the caſtle much in danger. I cannot call them ſpouts, that we have had, yet I may ſay they were cataracts. The rains have continued, though now moderate, above fifteen months; and yet we can hardly ſee three fair days together: but neither thunder, lightning, froſt, ſnow, extreme heat or cold, but of an equal temperature all the year."

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[p] Letter-book, vol. i. p. 89.

[q] It does not appear in the Regiſter.

[r] Original Regiſter, vol. ii. p. 291.

Mr. COLWALL mentioned, that Mr. THOROWGOOD, a maſter of a ſhip, who had received inſtructions from the ſociety for the Eaſt-Indies, was returned, and had ſome account to give of what he had done for the ſociety in his voyage; which he was deſired to bring in at the next meeting.

Dr. GODDARD produced ſome of the Barnet waters of two years old in a large glaſs-veſſel, which being cracked in one place, ſome ſalt was found on the outſide of the glaſs about the crack; which ſalt put upon a coal melted, and was looked upon as of a peculiar kind.

Mr. HOOKE was ordered to make obſervations both upon the inſects of the rain-water and the Barnet water; to draw ſchemes of them; and to ſee whether they will change into other kinds, and to what bigneſs they will grow.

He produced his explications of the new ſounding inſtrument, and of the veſſel, that fetched water from the bottom of the ſea; and of the engine for determining the force of gunpowder by weight. He was directed to draw the figures in great againſt the next meeting, for the better ſatisfaction of the members.

He produced a ſcheme of the pleiades, as he had lately obſerved them mingled with other ſtars; among which he had diſcovered ten kinds of magnitude below the fifth. He repreſented in this ſcheme above eighty ſtars, whereas GASSENDUS hath ſet down but thirty-five near the ſaid pleiades. He was deſired to continue theſe obſervations, and particularly to make ſome of the ſheath of Orion, the triangular ſtar, *&c.*

It being related by Mr. OLDENBURG the ſecretary, that he had been deſired in a letter written by Monſieur LUDOLF, counſellor of the duke of Saxe-Gotha, to procure from the ſociety for a domeſtic of that prince, who was to be ſent into Egypt and Ethiopia, ſome inſtructions of inquiries fit to be made in thoſe parts; and that it would be a great ſatisfaction to the ſaid prince to be gratified therein, the ſociety deſired Mr. BOYLE, Mr. HENSHAW, and other members, who had opportunity, to draw up ſome queries for that purpoſe: and Mr. HENSHAW having been already deſired to think upon this matter, gave in a paper of his containing inquiries for Egypt, which was read, and ordered to be regiſtered [1], as follows:

1. " Whether it rain there at any time, at what time of the year? whether rain
" make the air wholeſome or peſtilential, or otherwiſe unhealthful?

2. " To conſider the nitre, that is commonly ſold there, and what affinity there
" is between that and our common ſaltpetre; to try by diſſolving it in warm water,
" filtring it well, then boiling almoſt half away, and putting the remainder in an
" earthen pan, ſet in a cool place for two days, to ſee, if it will ſhoot into cryſtals
" of petre. To ſend two or three hundred weight of it into Europe. To inquire
" of the manner how nitre is made.

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[1] Original Regiſter, vol. ii. p. 292.

3. " Whether it be true that the Arabs can charm the crocodile? or whether there be on the Nile ſide any taliſmans or conſtellated figures beyond which the crocodile cannot paſs.

4. " To inquire particularly into the manner of hatching eggs in Egypt; how the camel's dung is prepared wherein they are laid; how often the eggs are turned; how covered: whether they hatch in one and twenty days, as they do with us under a hen; whether the chickens are as perfect as ours? if imperfect, whether that may not happen to them by rough handling, while they are removed (being very tender) out of the place where they are hatched? to take the deſigns of the manner how, by the pipes, the heat is conveyed into ſeveral rooms? how they treat them betwixt the time of their hatching and taking away by the owners? whether they do not alſo hatch eggs under hens?

5. " To inquire at Cairo for ſeveral other drugs, which are common there, and much in uſe; yet are not brought into Europe? as acacia, calamus odoratus, amomum, coſtus, ben album, and divers others ſuch like.

6. " To take an account of the wooden locks there, which are ſaid to be made with as great art, as thoſe of iron with us.

7. " To inquire whether the great quantity of yellow amber, which is to be ſold at Cairo, be, by reaſon that amber is the gum of a certain tree growing in Egypt or Ethiopia, as BELLONIUS after DIODORUS SICULUS affirms: and that beſides ſeveral animals, that are often found incloſed in that amber, there is very frequently ſome part of the bark of a tree found ſticking to it.

8. " To inquire of a certain tree growing in Arabia, not far from Cairo, which bears a fruit ſtuffed with wool, that is finer than ſilk; of which the Arabs make linen, that is ſofter than ſilk, and whiter than cotton.

9. " Whether the female palm-tree be not fruitful, unleſs ſhe grow by the male?

10. " Whether children born there in the eighth month do uſually live? contrary to what happens in other countries.

11. " Whether crocodiles, that are found to be ſometimes thirty foot in length, are hatched from an egg no bigger than a turky's?

12. " Whether the ichneumon or Egyptian water-rat, can kill a crocodile, by ſkipping into his mouth, and gnawing his way out; as old writers affirm?

13. " To inquire whether the appearance of the legs and arms of men appearing out of the ground, to a very great number, at a place five miles from the city of Cairo, on Good-Friday, do ſtill continue? and how that impoſture is performed?

14. “To inquire whether the earth of Egypt, adjoyning to the river, preſerved
“and weighed daily, keeps the ſame weight till the 17th of June; and then grows
“daily heavier, with the increaſe of the river.

15. “Whether, tho' the plague be never ſo great before, yet on the firſt day of
“the river's increaſe, the plague not only decreaſeth, but abſolutely ceaſeth; not
“one dying of it after?”

The following experiments were appointed for the next meeting:

1. Of the mouſe in the compreſſing engine.

2. The proſecution of the experiment of Monſieur HUYGENS with a ſucker applied to the receiver.

Auguſt 13. At the COUNCIL were preſent

The lord viſcount BROUNCKER,
preſident.
Mr. BALLE.
Mr. EVELYN.
Dr. WILKINS.
Dr. GODDARD.
Mr. PALMER.
Mr. HILL.
Mr. OLDENBURG.

Mr. PALMER reported from the lawyers, that but one vice-preſident of the ſociety could be ſworn at a time.

The preſident was deſired to give Mr. POVEY thanks in the name of the council for his care and endeavours to procure the Savoy for the uſe of the ſociety: but withal to intimate to him, that by reaſon, both of want of accommodation ſufficient there, and ſome inconveniencies found in the terms of the indenture, the council thought fit to withdraw from that buſineſs.

September 2. At a meeting of the SOCIETY Monſieur HUYGENS's experiment was proſecuted by the application of a ſucker, but was brought to no iſſue at this meeting, and therefore to be continued at the next.

The experiments of cloſing up of gunpowder, *aurum fulminans*, and water, in three balls of ſteel ſeverally, being again made; and that with gunpowder alone being fired and broken, it was debated, what might be the cauſe, that the gunpowder ſhould fire, and not the gold powder, the latter being the ſtronger of the two? Some conceived, that a ſulphureous matter might exſude out of the heated ſteel, and be communicated to the gold powder, whereby its fulminating virtue might be deadned. Others thought, that this powder might fire within the ball (having left ſome air in it, becauſe not filled full with the powder) and the noiſe not be heard at a diſtance. Others were of opinion, that the penning it in, and giving it but a ſlow heat, might make it melt, it being found ſticking to the ſides of the ball upon the cutting it aſunder. It was ordered hereupon, that the operator ſhould beſpeak two balls with cavities no bigger than a pea, to fill them full ſeverally with *aurum fulminans* and gunpowder.

Sir Kenelme Digby ſuggeſted, that it might be tried, whether the gold-powder ſticking to the ſides of the ball, after its being heated, would fulminate in the open air.

Dr. Wilkins put the company in mind to improve their former conſideration of making an hiſtory of the weather, in order to build thereupon an art of prognoſticating the changes thereof: And he ſuggeſted, that it might be recommended to ſome of the members of the ſociety, to make conſtant obſervations, at leaſt of the moſt conſiderable changes of weather: in order to which, Mr. Hooke was deſired to engage herein, which he did; and Dr. Wilkins undertook to recommend the ſame to Dr. Power. It was alſo thought proper, that Dr. Wren ſhould be written to, to ſend to the ſociety a ſcheme of his weather-engine, formerly propoſed, in order to ſee whether it needed any addition or not.

Sir Kenelme Digby related, that Dr. Dee [t], by a diligent obſervation of the weather for ſeven years together, acquired ſuch a prognoſticating ſkill of weather, that he was, on that account, accounted a witch.

Sir Kenelme read a letter, ſent to him out of the Palatinate, concerning ſome children ſnatched away in thoſe parts by beaſts, that had the appearance of wolves; but found killed after ſo ſtrange a manner, that all people thereabout ſurmiſed, that they were not wolves, but *lycanthropi*, ſeeing, that nothing of the bodies of thoſe children were devoured, but the heads, arms, and legs, ſevered from their bodies, the ſkulls opened, and the brains taken out and ſcattered about the carcaſes, and the hearts and bowels, in like manner, pulled out, but not devoured. The ſociety judged, that the truth of the matter of fact ought to be well atteſted, before any thing be pronounced of it.

Sir Kenelme preſented a letter written to him by Dr. Straus, phyſician to the landgrave of Heſſe Darmſtadt, concerning a fœtus found petrified in part in the cavity of a woman's belly, out of the matrix; about which the writer of the letter diſputed, whether it was a twin-ſiſter, the fœtus being found a female; or a daughter of the woman, out of whoſe belly ſhe was cut; and concluded, that it was her daughter, which by the hardneſs of her body, and length of time, had broken through the matrix into the cavity of the belly, the matrix being healed up again of itſelf, and found cicatriſed by the ſurgeon. This letter was ordered to be filed up.

Monſ. Huygens preſented a paper from his father Monſ. Zuylichem, containing a deſcription of a new kind of candleſtick, by means of which, the candle upon it gives more light than two torches together, conſumes leſs wax, frees from the inconvenience of ſmoking in the narroweſt room, and needs no ſnuffers. The paper was ordered to be tranſlated from the French, and regiſtered [u].

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[t] John Dee, an eminent mathematician in the reign of queen Elizabeth, and warden of Mancheſter-college: he died about September, 1607, in the 81ſt year of his age.

[u] Original Regiſter, vol. ii. p. 295.

Mr. Hooke produced a microſcopical obſervation of a worm bred in rain-water, and turned into a gnat.

Sept. 7. At a meeting of the Council were preſent,

The lord viſcount Brouncker,
preſident.
Mr. Brereton.
Mr. Boyle.
Mr. Aerskine.
Mr. Balle.
Dr. Wilkins.
Dr. Goddard.
Mr. Henshaw.
Mr. Palmer.
Mr. Hill.
Mr. Oldenburg.

The 1ſt, 2d, 3d, and 5th ſtatutes of the 3d chapter; and the 1ſt, 2d, 3d, and 4th ſtatutes of the 8th chapter, paſſed, with a few alterations, the ſecond time.

Sept. 9. At the meeting of the Society, Monſ. Huygens's experiment was preſented, with a ſucker applied to the glaſs cane; but the water would not leave the top upon ſuction. The preſident was deſired to make this experiment with mercury by himſelf, and to inform the ſociety of the ſucceſs of it; which he undertook to do.

The experiment with the two balls and two powders was deferred till the next meeting, the balls not being ready.

The preſident and Mr. Boyle were deſired to conſider of the odd phænomenon in Monſ. Huygens's experiment, for the finding a ſolution of it.

Mr. Boyle mentioned the expanding of ſpirit of wine in a ſealed glaſs in his engine upon the exhauſting of the air. It was ordered, that the experiment ſhould be tried before the ſociety.

Mr. Charles Howard produced a letter of Mr. Roger Bradshaigh to Richard Gerrard, eſq; dated at Haigh, Aug. 25, 1663, confirming his former relation concerning a water and an earth in the eſtate of Mr. Molyneux of Hawkſley near Wiggan in Lancaſhire, which would light a candle at half a yard diſtance. It was ordered, that an extract ſhould be made of this letter, and regiſtered [*].

Mr. Balle mentioned, that there is a place near Grenoble in France of the like nature, taken notice of by Gassendus in his *Philoſophia Epicuri*.

Mr. Boyle propoſed, that two canes with quickſilver might be kept a while, one at Greſham-college, the other to be kept by himſelf, in order to obſerve carefully how they would vary, as to the aſcent and deſcent of the quickſilver in ſeveral weathers. The Society thought proper that this ſhould be put in execution.

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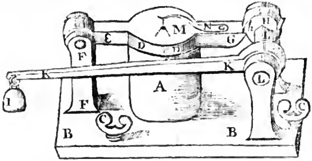
[*] Supplement to the Letter-books, vol. iv. p. 59.

He propoſed, that a ſealed thermometer with ſpirit of wine might be kept in a good cellar for a whole year, in order to obſerve diligently how it would vary there in ſummer and winter. This was ordered to be executed, and the thermometer to be put in the cellar of Greſham-college.

Mr. Oldenburg mentioned, that Mr. Beal was willing to engage in the obſervation of the weather, and in regiſtering the changes thereof; and that he hoped to ſet the ſame at work in other parts of the country; deſiring to be furniſhed with thermometers of the ſame figure and ſize. Whereupon Mr. Hooke was ordered to give the operator directions to provide a dozen ſealed thermometers with ſpirit of wine, to be ſent to Mr. Beal, and into other parts of the world.

Mr. Hooke brought in a ſcheme of the inſtrument for determining the force of gunpowder by weight, together with an explication thereof; which was ordered to be regiſtered[1], as follows:

“ This inſtrument for the trial of powder conſiſts of, A, an iron barrel, of what bore and thickneſs is thought convenient, faſtened into an iron plate or pedeſtal B B, which pedeſtal may be faſtened to any floor or ceiling by the ſcrews C C:



“ This barrel is exactly cloſed at the top by the cover D D, which is ſo even and truly wrought, as to touch it very cloſely, and in every place; one end E, of this cover is faſtened by a joint into the pillar F F, the other end G, is kept down very firmly by the end or nick of the nut H: this nut is very powerfully kept in that poſture by a weight I, hung upon the end of the beam K K, that is faſt upon the ſame pin L L, to which the nut alſo is. In the cover is the touch-hole M, tapering outward, which hath a valve ſo contrived, with a ſpring N, that as ſoon as the touch-powder is fired, it is by the valve ſo cloſe ſhut, that the ſtrength of the powder cannot ſpend itſelf that way: a uſual inconvenience not provided againſt in other contrivances.

“ The way of calculating what proportion of ſtrength, placed at the middle of the cover, is requiſite to move the weight I, hung at the end of the beam, is

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[1] Original Regiſter, vol. ii. p. 298.

" very eaſy; for it will be as half the diſtance of the corner *b*, of the nut, from " the axis of the pin L L, is to the diſtance of the weight I, to the force againſt " the cover, which is requiſite to move it when ſo kept down. So that if thoſe " diſtances are in a decuple proportion, five pound hung at I, will keep the " cover as ſtrongly down upon the end of the barrel, as an hundred weight ſet " upon the cover D D, can do."

Mr. Hooke produced likewiſe a microſcopical obſervation of the ſeveral parts of a fly.

Sept. 14. At a meeting of the Council were preſent,

The lord viſcount Brouncker, preſident.
Mr. Boyle.
Mr. Brereton.
Mr. Aerskine.
Dr. Clarke.
Mr. Palmer.
Mr. Hill.
Mr. Oldenburg.

The ſtatutes for the election of the council and officers were read, but could not paſs for want of a quorum.

Sept. 16. Dr. Clarke read his experiments of the injections, which he had made of ſeveral liquors into the veins of dogs; and was deſired to proſecute this ſubject; and the account brought in by him was ordered to be regiſtered[r].

Several reflections were made upon this diſcourſe of Dr. Clarke's, ſome obſerving, that any thing thus injected, without preparation and digeſtion, into the veins, would make odd commotions in the blood, diſturb nature, and cauſe ſtrange ſymptoms in the body; others ſuggeſting thereupon, that trials ſhould be made with ſuch liquors, as were prepared of ſuch things, as had paſſed the digeſtion of the ſtomach, as ſpirit of urine, of hartſhorn, of blood, &c. in order to ſee what effects would follow upon them. Some propoſed the experiment, to let the blood of a luſty young dog into the veins of an old one, by the contrivance of two ſilver pipes faſtened to the veins of ſuch two dogs with a leather pipe between both to move the blood forward; by which means the extravaſating of the blood might be avoided. Others added, that theſe injections would hardly ſerve for any medical uſes; but perhaps by filling the veſſels of an animal as full as they could hold, and by diſtending them exceedingly this way, new veſſels might be diſcovered.

Dr. Wilkins propoſed the experiment of making a piece of the ſkin of a dog to grow upon another. Some things were objected againſt the probability of the ſucceſs thereof, *viz.* how veins, arteries, and fibres, could diſſeminate themſelves, and grow into this ſtrange piece of fleſh patched on; it being neceſſary, even to the reſtoring of a ſeparated part to the ſame animal, that there may be left ſome veſſels, and that they join one another; and it being hardly conceiveable, how the healing can be effected, where the orifices of the ſaid veſſels do not meet. Others alledged experience and ſeveral examples of ſeparated parts healed together again. It was ordered hereupon, that the experiment ſhould be firſt tried with a piece of ſkin cut from the body of a dog, and ſewed on again upon the ſame dog: and Dr. Croune and Mr. Hooke were appointed curators thereof, and the operator ordered to provide a dog againſt the next meeting.

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[r] It does not appear in the Regiſter. Doctor Clarke's experiments are mentioned in the *Philoſophical Tranſactions*, nº 7. p. 130. for Dec 4. 1665, where it is remarked, that he had *made it part of his buſineſs to purſue the experiments* of conveying liquors into the maſs of blood with *much induſtry, great accurateneſs, and conſiderable obſervations thereon; which, above two years ſince, were by him produced and read before the Royal Society, who thereupon deſired him, as one of their members, to compleate what he had propoſed to himſelf upon that ſubject, and then to publiſh the ſame.*

Mr. Hooke was alſo deſired to try the growing of hair, and of a cock's-ſpur upon the head of a cock.

It was ſuggeſted, in a letter from Mr. Beal, that it would be worth the trial, to ſee what effects would be produced on plants put into the pneumatic engine with the earth about their roots, and flouriſhing; whether they would not ſuddenly wither, if the air were totally taken from them; and particularly to try, in the ſeaſon, cherry-bloſſoms, when partly opened, partly not opened, upon a branch, whether the air may be ſo attenuated as to blaſt: To which he added this advertiſement, that the bloſſoms do not immediately diſcover the blaſt, an old experienced countryman having once given him notice of a blaſty noon (it being then ſultry weather, and ſomewhat gloomy with the thickneſs of exhalations, almoſt like a very thin miſt) and within a day or two ſhewing the proof upon the cherry-bloſſoms then flagging, but not much altering their colour till after two days more. It was ordered, that this ſuggeſtion ſhould be taken notice of, and the experiments made in due ſeaſon.

The operator was called upon for the thermometers, which he had been ordered at the laſt meeting to provide againſt this, to be ſent into ſeveral parts, for the obſervation of the weather. They not being ready yet, he was ordered to take ſpecial care to have them ready againſt the next meeting.

He was directed likewiſe to have ready againſt the next meeting a cylinder of mercury, to be kept in Greſham-college, for the obſerving the aſcent and deſcent thereof, according to the various conſtitution of the air; Dr. Croune mentioning, that he had found it riſe and fall, according to the degrees of cold and heat, but with ſome air left in the cane; and Mr Hooke alledging, that Mr. Boyle's cylinder had riſen in ſummer, and fallen in winter; and aſcribing this effect to the greater quantity of vapours exhaled in ſummer, cauſing more gravitation in the air.

It being again mentioned, that Dr. Wren's ſcheme for the obſervation of all the changes of weather ſhould be ſent for by Dr. Wilkins, the latter alledged, that he thought it was left with Mr. Boyle, whom the ſecretary was therefore deſired to ſpeak to concerning it.

Dr. Glisson ſhewed the ſociety a ſeal of a certain compounded metal, of which he ſaid he had heard, that when it was ſoft, it would take off the impreſſion from any hard wax; and being grown fixed, retain that impreſſion, and ſo ſerve for a ſeal.

Sept. 22. At a meeting of the Council were preſent,

The lord viſcount Brouncker, preſident.
Mr. Aerskine.
Dr. Wilkins.
Dr. Goddard.
Mr. Palmer.
Mr. Hill.
Mr. Oldenburg.

It was reſolved, that the order for collecting the arrears till Sept. 23. be renewed.

Dr. Goddard was deſired to bring in a draught of a ſtatute for laying up all the ſociety's monies in the cheſt, except 20 *l.* to be left in the treaſurer's hands for occaſional expences.

Sept. 23. At a meeting of the Society, the preſident gave an account of the experiment committed to his charge, about the not deſcending of water purged from air, propoſed formerly by Monſ. Huygens, and ſeveral times tried before the Society; which the preſident affirmed to hold good upon every accurate trial, even with the addition of a ſucker.

He was deſired to proſecute the experiment with quickſilver, and to bring in the particulars of the whole ſucceſs in writing, together with the ſolution of this phænomenon.

Mr. Pell made mention of a certain book, intituled, *Doxoſcopia*, publiſhed by a famous profeſſor of Hamburgh, Dr. Joachimus Jungius. He was deſired to peruſe this treatiſe, and to give an account of it to the Society.

Dr. Wilkins mentioned a perſon who had conſiderable collections of obſervations on the weather, made by Dr. Dee and others. He was deſired to make the perſon acquainted with Mr. Hooke.

Mr. Boyle informed the Society, that he had ſpoken with one, who was come from Conſtantinople, and told him, that the rainy weather had accompanied him from that city all along through Italy and France into England; a fact thought obſervable, for the great extent of the ſame weather.

Two glaſs canes were recommended, one to the preſident, and the other to Dr. Goddard, to have them filled with mercury, and to obſerve how they vary with the weather, comparing a thermometer of water with them, to ſee how they differ.

Dr. Wilkins was deſired to write to Dr. Wren, for his ſcheme of the inſtrument for obſerving all kinds of weather.

There was read a petition of the fiſhmongers, preſented to the parliament, concerning the annoyances, whereby the fry and brood of fiſh is deſtroyed, and the ſeveral ways, whereby the ſame may be preſerved. This was communicated by Mr. Graunt, and ordered to be filed up.

There was alſo read a Latin letter, drawn up by Mr. Oldenburg, the ſecretary, to be ſent to Dr. Eccardus Leichner of Erfort, in anſwer to his letter to the Society of the 16th of April, 1663, and read at the meeting of Aug. 26. It was ordered, that the anſwer ſhould be ſent, ſubſcribed by the ſecretary [a].

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[a] Letter-book, vol. i. p. 92.

The operator was ordered to have ready againſt the next meeting the iron balls for the trying of gun-powder and gold-powder; as likewiſe the thermometers with ſpirit of wine; the compreſſing engine; and the dog, for the cutting off a piece of his ſkin, and ſewing it on again.

Sept. 28. At a meeting of the Council were preſent,

The lord viſcount Brouncker,
preſident.
Mr. Aerskine.
Mr. Balle.
Mr. Evelyn.
Mr. Palmer.
Dr. Wilkins.
Dr. Ent.
Dr. Goddard.
Dr. Clarke.
Mr. Hill.
Mr. Oldenburg.

It was reſolved, that there ſhould be two diſtinct tables, one for the laws contained in the charter, and another for the by-laws.

Dr. Goddard brought in a draught of the ſtatute ordered at the preceding meeting of the Council; which was read, and paſſed the firſt time as follows:

> "All monies, or ſums of money, whereof there ſhall not be preſent occaſion for expending or diſpoſing to the uſe of the Society, ſhall be laid up in an iron cheſt, having three different locks and keys, whereof one ſhall be in the cuſtody of the preſident, another of the treaſurer, and a third of one of the ſecretaries; and the treaſurer ſhall not have in his cuſtody above twenty pounds at once; and accordingly, he ſhall pay in monies into the cheſt aforeſaid, and take out of the ſame, by order of the Council, as they ſhall judge expedient."

All the ſtatutes of the 5th chapter, concerning experiments, and the reports thereof; of the 7th, concerning the election of the council and officers; of the 9th, concerning the treaſurer and his accounts; of the 11th, concerning curators by office; of the 12th, concerning the clerk; of the 13th, concerning the operator; of the 14th, concerning the common ſeal and deeds; of the 15th, concerning the books of the Society; of the 16th, concerning benefactors; of the 17th, concerning the death or receſs of any fellow; of the 18th, concerning the cauſes and form of expulſion: all theſe paſſed the firſt time this meeting.

It was reſolved, that an order be iſſued for the collecting of the arrears of the weekly payments till Sept. 23, 1663.

The preſident was deſired to take care, that notice be given to Mr. Symmons, the engraver of the ſeal of the Society, to attend the Council at their next meeting.

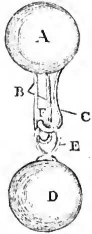
Sept. 30. At a meeting of the Society, Mr. Palmer preſented to the Society, from Mr. Edward Diggs, with two ſorts of ſilk, one coarſe, the other fine, ſent from Virginia, and made there; together with ſome written obſervations of Mr. Diggs's concerning ſilk-worms, and the making of ſilk, contrary to the received opinion thereof. Mr. Palmer was deſired to return the Society's thanks to the preſenter, and to let him know, how much they were pleaſed with his care and concern for improving of this manufacture; and how glad they ſhould be to receive information, from time to time, of the progreſs of it. The obſervations were ordered to be regiſtered [a], with a reference to thoſe, which were communicated by Monſ. **Monconys**; and ſome of the ſilk was given to Mr. **Hooke**, to be examined with a miſcroſcope. Mr. **Hill** was deſired to get the parcel of the coarſer ſilk to be put into a ſtuff for a cover to the mace; and Dr. **Goddard** to keep the parcel of the finer ſilk.

Mr. **Pell** ſuggeſted, that ſince the ſilk-worm ſeed, procured from Languedoc, yielded worms and bottoms in Virginia, as big again as they uſually have there of their own ſeed, ſome of the Virginia ſeed might be ſent into Languedoc, to ſee how that would thrive there.

A letter was read, written by Monſ. **de la Quintinye** to Mr. **Oldenburg** the ſecretary, concerning the neceſſity of replanting melons; concluding with expreſſions of his ſingular reſpect for the Society. It was ordered, that this letter ſhould be filed up [b], and that the ſecretary, in his private anſwer, ſhould let him know, that the Society received his civilities kindly.

Mr. **Hooke** brought in the deſcription of the new ways contrived by him for ſounding the depth of the ſea without a line, and fetching water from any depth; which were ordered to be regiſtered [c], as follows:

" The way, which I prefer before ſeveral other contrivances, which I thought " of, for ſounding the depth of the ſea; and fetching up water from any depth, " are theſe:



" The firſt is with a ball ſunk to the bottom of the ſea " by a weight of lead or ſtone, the which, as ſoon as it " toucheth it, preſently returns toward the top of the water, " leaving the weight behind, which is thus contrived. Between the long wire ſtaple B, of the ball A, I preſs in " with my fingers a ſpringing wire C, on the bended end F, " on which I hang the weight D, by its ring E, and ſo let " them down into the water in this poſture; towards the " bottom of which they are carried with a conſiderable " ſwiftneſs; which the weight D touching firſt, is thereby " ſtopped; but the ball, by the impetus it acquired in deſcending, being caried downwards a little after the other is " ſtopped, ſuffers the ſpringing wire C, to fly back, and " thereby ſets itſelf at liberty to re-aſcend.

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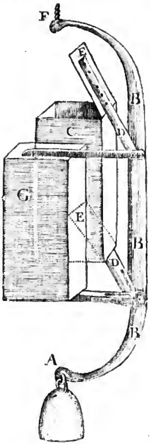
[a] Original Regiſter, vol. ii. p. 300. They are printed in the Philoſ. Tranſact. n° 2. p. 26.

[b] It is entred in the Letter-book, vol. i. p. 85. This letter is dated at Paris, 25 June, 1663.

[c] Original Regiſter, vol. ii. p 301.



"The way for fetching up water from any depth in the ſea, is with a ſquare wooden bucket C, whoſe bottoms E E are ſo contrived, that, as the weight A, ſinks the iron B, (to which the bucket C, is faſtened by the two handles D D, on the ends of which are the movable bottoms or valves E E) and conſequently draws down the bucket, the reſiſtance of the water to its deſcending, keeps up the bucket in the poſture C, whereby the water has all the while it is deſcending, a clear paſſage through; whereas, as ſoon as the bucket is pulled upwards by the line F, the reſiſtance of the water to that motion beats the bucket downwards, and keeps in the poſture G, whereby the included water is preſerved from getting out, and the ambient air from getting in."

Mr. HOOKE produced likewiſe three microſcopical obſervations; 1. Of the ſcales of a ſoal's-ſkin, preſented by Mr. PELL. 2. Of a piece of tabby. 3. Of the beard of a wild oat.

He was ordered to ſpeak to Mr. CHILDREY[4], concerning his collection of obſervations on the weather, and to make report thereof to the Society; as alſo to try, whether Mr. CHILDREY would grant the peruſal of them for the ſervice of the Society.

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[4] Author of *Britannia Baconica*.

It was ordered, that Mr. Matthew Wren be put in mind of procuring from the lord chancellor the papers of Mr. Harriot, who had alſo made conſiderable obſervations on the weather.

Mr. Colwall mentioned, that Mr. Bond was very ſure, that, according to his magnetical hypotheſis, the variation of the needle at London was this year 1 deg. 4 min. weſtward. Mr. Balle was deſired to make an obſervation hereof.

October 5. At a meeting of the Council were preſent

The lord viſcount Brouncker, preſident.
Sir Robert Moray.
Mr. Boyle.
Mr. Brereton.
Sir Paul Neile.
Sir Gilbert Talbot.
Mr. Aerskine.
Mr. Balle.
Mr. Henshaw.
Dr. Wilkins.
Dr. Goddard.
Dr. Clarke.
Mr. Palmer.
Mr. Hill.
Mr. Oldenburg.

All the ſtatutes, which paſſed September 28 the firſt time, paſſed this day the ſecond time.

The accounts of the treaſurer from the beginning of the Society till June 24, 1663, paſſed; by which it appeared, that

	l.	s.	d.
The ſum given in charge was	697	0	0
Whereof received	527	5	6
In arrears from divers members of the ſociety till June 24, 1663	158	4	6
Diſburſed by the treaſurer	488	8	3
Remaining in the treaſurer's hands	38	17	3
Remitted to ſeveral members of the ſociety by order of the council	11	9	0

It was ordered, that the preſident, Sir Robert Moray, and Mr. Boyle meet and conſider of the draughts brought in by Dr. Wilkins and Dr. Goddard concerning the entertainment and allowance of curators by office, when the ſociety ſhall be indowed with a revenue.

It was reſolved, that the experiments formerly brought in for the king's reception be farther conſidered of; and that this be the work of the council at their next meeting.

It was ordered, that Dr. Clarke endeavour to get the collection of inſects mentioned by him this day, againſt the king's reception: And

That Mr. Hooke be deſired to be preſent at the next meeting of the council.

October 7. At a meeting of the Society, a mouſe was put into the compreſſing engine; and though four times as much air was forced into it, as was in it, yet the animal appeared not to receive any alteration thereby.

Mr. **Graunt** produced a ſtone ſent out of Derbyſhire, in which there ſeemed to be natural ſtony ſcrews; but upon examination it was found, that they were not ſcrews, but parallel circles.

He gave an account of Sir **William Petty**'s new ſhip's having ſuffered a great ſtorm in the harbour of Dublin, where it was riding at anchor with one only man in her, who cut the cable, and let her drive aſhore, where ſhe bulged a plank; upon the repair of which the ſhip would immediately come away for London.

The preſident acquainted the ſociety with the ſucceſs of Monſieur **Huygens**'s experiment made by him with mercury, *viz.* that upon the exhauſting of the air, the quickſilver had ſtood 34 inches high; and that he had obſerved, that it never fell but when a bubble broke: as alſo, that when it fell and broke, it fell at once as low, as it would fall by three ſuctions. Upon which he was of opinion, that no account could be given of this phænomenon from the equiponderancy of the air; and conſequently the ſtandard of the mercury being 29 inches, the reſt muſt be from ſome other cauſe.

Mr. **Boyle** ſeconded this relation, affirming, that he had made the like experiment, and found the quickſilver ſtand at above 50 inches; and he acknowledged, that ſomething elſe muſt be taken in to explain this odd phænomenon.

The preſident and Mr. **Boyle** were both deſired to proſecute and conſider farther this experiment, and to give both the matter of fact, and their thoughts of the cauſe of it, in writing.

Sir **Robert Moray** produced a round ſtone given in by Mr. **Godolphin**, who affirmed it to have been broken out of a rock. It was recommended to Mr. **Boyle** to break it, and obſerve the quality of it.

Sir **Robert Moray** produced alſo a mineral preſented to him by Col. **Long**, in whoſe ground it was found, ſmelling like ſulphur, and ſtrongly taſting of vitriol; which Mr. **Boyle** alſo was deſired to take home with him, and to examine it.

Capt. **Silas Taylor** mentioned, that there was a mine in Cornwall an hundred fathom deep, concerning which Col. **Noy**, living in that country, had made a conſiderable diſcourſe, which by means of Dr. **Hoare** might be obtained of him. It was ordered, that Dr. **Hoare** ſhould be ſpoken to concerning it; as alſo, that Dr. **Merret** ſhould be deſired to communicate to the ſociety what he knew of the ores and minerals of Devonſhire and Cornwall; and that Dr. **Cotton** ſhould be written to by Mr. **Balle**, to procure the beſt information he could concerning that ſubject.

The two iron balls, one filled with *aurum fulminans*, the other with gunpowder, were tried in a coal-fire, where that with gunpowder fired and gave ſome report, yet without breaking the ball, only making a little crack in it; but that with *aurum fulminans* did nothing.

Dr. **Goddard** was deſired to add theſe trials to his former account concerning the like experiments.

Mr. **Hooke**'s paper concerning the obſervables for making a hiſtory of the weather was read, and ordered to be reviewed by the preſident and Sir **Robert Moray**, and then to be regiſtered, and ſent to the ſeveral perſons, who had been engaged in this work of obſerving the changes of weather, as Dr. **Power**, Mr. **Beal**, *&c.*

The operator produced four of the thermometers, which he had been ordered to provide and adjuſt; of which the preſident was deſired to take one, and Dr. **Goddard** another, to put them into their cellars, and to obſerve whether they were warmer in winter than in ſummer.

For the adjuſting of theſe thermometers it was thought ſufficient to know what mark they ſtood at then; and for the making of obſervations, to take notice, how they ſhould afterwards differ from this mark.

Mr. **Hooke** was ordered to bring in at the next meeting an hygroſcope made of the beard of a wild oat, with an index.

Dr. **Goddard** propoſed for an hygroſcope the contrivance of a luteſtring with pullies and a cylinder; and was deſired to try it.

He gave ſome account of the variations of quickſilver in a glaſs-cane, having obſerved, that it varies not according to wet or dry, hot or cold, but according to the thickneſs or clearneſs of the air, having found it loweſt, when the air was thickeſt.

Sir **Robert Moray** promiſed to ſend in at the next meeting ſome bottles of water, which had been carried from England into the Eaſt-Indies, and brought back again.

Mr. **Hill** related, that a ſhip-maſter had told him, that he had in the Mediterranean drawn ſome of the water, that was grown ſtinking in the cloſe veſſels, into tubs, where having ſtood expoſed to the air for two or three days, it was grown ſweet again, and good to drink.

Dr. **Croune** acquainted the Society, that Dr. **Pugh**, who had formerly given them ſome informations concerning the Pico of Teneriffe, had good hopes of procuring a couple of the imbalmed bodies of the *Guances* in the Canary iſlands.

Sir **Robert Moray** mentioned a new way of hatching pigeons uſed by Dr. **Wallis**, and put in writing. It was ordered to be read at the next meeting.

Mr. **Boyle** communicated an eaſy method of preventing the rot in ſheep: which was likewiſe ordered to be read at the next meeting.

October 12. At a meeting of the Council were preſent

Dr. Wilkins, vice-preſident.
Mr. Boyle.
Mr. Aerskine.
Mr. Balle.
Mr. Evelyn.
Dr. Goddard.
Dr. Clerke.
Mr. Palmer.
Mr. Hill.
Mr. Hooke.

Mr. Hooke was alſo preſent, according to the order of the laſt meeting of the council.

This meeting being appointed for the farther conſideration of experiments fit to entertain his majeſty with, ſeveral of the members preſent were charged to be curators of the following experiments:

Mr. Boyle,

1. To make the mercury ſtand above the uſual ſtation.

2. To make a conſiſtent ſubſtance of ſpirit of wine and a certain other liquor.

3. To make two liquors ſmoke by approach.

4. To ſink a ſubſtance in a glaſs by pouring in more water.

5. To make two poliſhed marbles adhere, notwithſtanding a great weight appendant to the undermoſt.

6. To make water aſcend by ſuction.

7. To turn a greeniſh opacious liquor, partly into a tranſparent red, and partly into a whitiſh ſubſtance, by the affuſion of a clear liquor.

8. To try the magnetical experiment of altering the polarity by repercuſſing the extremes of an iron-rod, made red-hot and refrigerated; and alſo of deſtroying all the magnetiſm by ſtriking it in the middle.

9. To deſtroy the attractive virtue in a load-ſtone by heating it red-hot, whilſt it keeps the directive virtue.

Dr. Goddard,

1. To provide his hygroſcope with pullies and lute-ſtrings.

2. To make a great weight float with a very little water.

Dr. Ent,

To bring in the anatomy of a lobſter and an oiſter to be drawn by Mr. Hooke.

Dr. Clarke,

To provide the collection of inſects mentioned by him at the preceding meeting of the council.

Col. Long,

To bring in his apparatus formerly offered by him on the 6th of July, and for that purpoſe to be written to by Mr. Oldenburg.

Mr. Hooke,

1. To take care of preparing thoſe experiments, that ſtood upon his account.

2. To make ready the two thermometers of Dr. Wren's invention, one of tin, the other of glaſs.

3. To make an artificial eye.

4. To try the caſting of a picture on a wall in a light room; and to beſpeak a concave glaſs for it.

5. To give order for the making of the engine, to determine the force of gunpowder in by weight.

6. To make a hygroſcope with the beard of a wild oat.

It was ordered, that the aſtronomical quadrant, contrived by Dr. Wren, be produced at the time of his Majeſty's reception: And

That a book be provided by the amanuenſis for his majeſty's ſubſcription.

It was voted the firſt time, that in the ſtatute of the obligation to be ſubſcribed, theſe words, *or to be elected*, be, in both the places, where they occur in this ſtatute, repealed.

October 14. At a meeting of the Society, the following receipt to prevent the rot of ſheep preſented by Mr. Boyle, and affirmed by him to have been made uſe of by a perſon of note with good ſucceſs, was read, and ordered to be regiſtered [e].

" A pretty while before Allhollantide the ſheep is to be blooded under the eye, " and, if need be, he is to be blooded in the ſpring; and in October his gums may " be rubbed at three or four different times with Spaniſh ſalt. But the main part " conſiſts in this, that about Allhollantide, or ſomewhat ſooner, you take a ſmall " handful of the forementioned ſalt, and making the ſheep hold up his head, compel him to ſwallow it, and keep him from drinking any thing for about an " hour after."

A new way of hatching pigeons, ſent from Oxford, and there tried by Dr. Wallis, was read, and ordered to be regiſtered [f], as follows:

" Keeping ſome tame pigeons about our houſe, we had a pair hatched on the " 13th of July laſt, the day of our public act at Oxford. The next morning we " went from home; and having been abſent almoſt ſeven weeks, we found, upon our return, this pair of pigeons well grown and lively; and making a neſt as others do, when they are ready to lay eggs and ſit. But not finding them to lay (as indeed at that age it could hardly be expected) we did, about the 2d or 3d of September, take two eggs, newly laid, from another pair, and put under theſe young ones: who, though too young to lay eggs of their own, did ſit on theſe very diligently by turns (as the cock and hen-pigeon uſe to do); which they were ſo deſirous to do, that they would often fight for the neſt, or pull one another off; or at leaſt ſit waiting with much patience for the neſt.

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[e] Original Regiſter, vol. ii p. 303.

[f] Ibid. p. 303.

"And they did on Monday laſt, Sept. 21, hatch two young ones (themſelves being that day ten weeks old) and are now brooding them as older pigeons do.

"That pair, from whence theſe eggs were taken, did, within four or five days after, lay again, and do now ſit, almoſt ready to hatch.

"That pair, from whence theſe two young breeders were hatched, have already laid and brought their eggs to good ſeven times ſince March laſt. And the hen of their firſt brood, hatched in March, hath, with another cock (her own mate being ſtolen, or killed, or otherwiſe miſcarried, we know not how) laid, and hatched, and is now brooding her young."

Mr. BOYLE gave ſome account of the mineral committed to his examination at the preceding meeting; and he affirmed it to abound with vitriol mixed with ſome brimſtone; and that a ſolution of copperas made of it, and put to galls, turned not to black, but blue: as alſo, that ſome of the mineral being laid in a window, got an efferveſcence of the taſte of vitriol. He was deſired to examine it farther, and to ſee whether it will ſhoot, *&c.*

Dr. HOARE being ſpoken to concerning the account of the Cornwall mines, mentioned at the laſt meeting to be written by Col. NOY, promiſed to communicate it to the ſociety within a little time.

The experiment of making the quickſilver ſtand above its uſual ſtation was farther inquired into; and Mr. BOYLE affirmed, that he had tried it again, and kept it ſuſpended to the perpendicular height of 52 inches with water. It was again recommended to his farther proſecution.

The operator was called upon for the reſt of the thermometers, to have them ready againſt the next meeting.

Occaſion was here taken by Dr. WILKINS to inquire about the original of this kind of thermometers with ſpirit of wine, ſealed up: to which Mr. BOYLE anſwered, that they were brought out of Italy; and that he thought, that he had received thence the firſt thereof here in England.

It was queried, whether this way might be practicable with common water; and Dr. GODDARD affirmed, that he had tried it ſo, and found the greateſt variation thereof to be not above two inches.

Dr. CROUNE and Mr. HOOKE not having yet met to cut a piece of dog's ſkin and ſew it on again, in order to ſee whether it will grow; and Dr. CHARLETON affirming, that he had tried this experiment formerly, he was deſired to meet on the Friday following, with the other two curators at Greſham-College, and there to make the experiment together.

Mr. HOOKE was deſired to lodge ſome days in Greſham-College for the well-fitting the compreſſing engine, and the giving order to the operator for the making the engine deſcribed by him to determine the force of powder by weight; as alſo for the artificial eye, and the perfecting Dr. WREN's new kind of thermometer with two round glaſſes and quickſilver in them.

Dr. CHARLETON not having yet procured the unſpleened dog from Bath, to open him, and to ſee, whether any thing was come in the place of the ſpleen cut out, or what change there might be about thoſe parts; Dr. HOARE affirmed, that he had himſelf opened ſuch kind of cut dogs after a whole year's exſection, but found nothing grown inſtead of the ſpleen, nor any thing elſe remarkable in thoſe parts.

Dr. HOARE related, that he ſaw a perſon, who by the parings of horſe-hoofs fried in any ſweet oil, and carried in his pocket, made any dog follow him, and leave any other meat for this.

Mr. BOYLE obſerved, that the parings of horſe-hoofs had been found good to ſtay fluxes, having a conſiderable quantity of volatile ſalt in them.

Dr. HOARE promiſed to bring in an account of a cock's ſpurs growing on a cock's head.

Mr. CLAYTON affirmed, that he had ſeen at Dr. BROWN's a horn growing on a cock's head naturally.

The operator was ordered to provide a cock againſt the next meeting, in order to try the experiment of making feathers grow on his comb.

Mr. BOYLE mentioned, that a perſon had made a horn to grow on the forehead of a horſe.

Mr. CLAYTON related, that a lady having loſt one of her teeth, a porter was hired, one of whoſe teeth was drawn by LA ROCHE, and put into her mouth, where it grew firm.

This was confirmed by Dr. WHISTLER, who related, that the ſame LA ROCHE hit on this art accidentally, having once drawn out the wrong tooth of a country-man; for which miſtake LA ROCHE finding him extremely inraged, he told him, that if he would have but a little patience, he would put the tooth in, and make it grow again as firm as before; which he accordingly did, ſetting in the good tooth, and putting the gums carefully about it.

Dr. CHARLETON mentioned, that the lord HATTON's ſon having ſome of his teeth ſtanding much awry, had them looſened, but without pulling them quite out, and ſet ſtrait.

Mr. WATERHOUSE acquainted the Society, that he had ſpoken with Mr. CHILDREY concerning his collection of obſervations of all kinds of weather; and that Mr. CHILDREY was willing to communicate them to the ſociety after he had looked them over, and brought them into ſome order.

Mr. HOOKE communicated two microſcopical obſervations, one of a common fly, the other of moſs grown upon a brick, together with the ſeed.

Mr. EVELYN produced the meaſure of a yew-tree ſtanding at Braburn, two miles from Scots-hall in Kent, being twenty yards in compaſs, and ſeventeen feet at leaſt in diameter.

October 19. At the meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER, preſident.
Mr. BOYLE.
Sir ROBERT MORAY.
Mr. AERSKINE.
Mr. BALLE.
Dr. WILKINS.
Dr. GODDARD.
Dr. CLARKE.
Mr. PALMER.
Mr. HILL.
Mr. OLDENBURG.

It was voted the ſecond time, that in the ſtatute for the obligation to be ſubſcribed, theſe words, *or to be elected*, be in both the places, where they occur in this ſtatute, repealed.

The whole body of the ſtatutes was read, and ordered to be written fair by the amanuenſis.

It was ordered, that Mr. HOOKE have the keeping of the repoſitory of the ſociety, for which the weſt [a] gallery of Greſham College was appointed: And

That one of the new inſtruments for ſounding without a line be made ready by Mr. HOOKE, amongſt the other things deſigned for his majeſty's reception.

Upon a propoſal of Mr. BOYLE concerning ſome overture made by another perſon of conſiderable advantage to the ſociety, which in the nature of it required ſecrecy, it was ordered, that the lord viſcount BROUNCKER, Sir ROBERT MORAY, and Mr. OLDENBURG have full power to treat and agree with the ſaid perſon upon ſuch terms, as they ſhall think reaſonable for the good of the ſociety.

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[a] Or white. Dr. WARD's Lives of the profeſſors of Greſham-College, p 174.

It was likewiſe ordered, that the common ſeal of the ſociety be produced and ſhewn to the ſociety at their meeting.

October 21. At the meeting of the Society, an account was given by Mr. Oldenburg, the ſecretary, of a letter[h] written to him from Paris October 12, 1663, N. S. by Monſieur Peter Petit[i], a member of the Montmorian academy at Paris, deſiring in the name of the ſaid academy to be informed from the ſociety, what had been the tranſactions of Monſieur De Sorbiere amongſt them, when he was preſent at their meetings; and in particular, whether he had pretended to be by the ſaid academy deputed to eſtabliſh a ſtricter correſpondence. Monſieur Petit obſerved, that Monſieur De Sorbiere had no orders from the academy, having gone to England without acquainting any perſon, except Monſieur De Montmor, with his intended journey thither; and that the academy would not have been guilty of ſo great an incivility, as ſending him without a letter to the ſocity and the preſident, if they had had any intention of deputing Monſieur De Sorbiere for the eſtabliſhing a nearer correſpondence: nor was the academy pleaſed with his printing a diſcourſe, after he had been deſired and had promiſed not to do it. The ſociety upon hearing the account of this letter declared, that the ſaid Monſieur De Sorbiere had pretended to no ſuch deputation, nor tranſacted any thing with them in the name of the Pariſian academy; and it was ordered, that the ſecretary ſhould ſignify this in his anſwer to Monſieur Petit; which he did in a letter in French of the 30th of this month[k], in which he obſerved, that Monſieur De Sorbiere had, at the meetings of the ſociety, behaved himſelf with all poſſible civility, and, in his private converſation with the members, only teſtified his zeal for the advancement of ſolid and uſeful ſcience; on which account, as well as that of his being of the Pariſian academy, he had been admitted into the Royal Society the ſame day with Monſieur Huygens[l]. Mr. Oldenburg added, with regard to a ſtricter correſpondence between the ſociety and academy, that it did not appear to him to want the being inforced by formal deputations; ſince the nature of the thing required it, the object of ſcience being of ſo vaſt an extent, that it demanded the united genius of more than one nation to exhauſt the ſubject.

Mr. Colwall preſented the ſociety with the anſwer to ſome of the inquiries formerly ſent by him to the Eaſt-Indies; and acquainted them, that theſe inquiries were ſo well received in thoſe parts, that they had been ſent to all the Engliſh factors there, and had excited them to a curious ſearch and obſervation of many other things, of which the Society might, in time, expect a good account. This anſwer, which was written at Bantam, Nov. 14, 1662, was ordered to be regiſtered [m], and was as follows:

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[h] Letter-book, vol. i. p. 104.

[i] eminent for a great number of learned works upon various ſubjects. He died at Paris December 12, 1687, in his 71ſt year.

[k] Letter book, p. 105.

[l] Monſieur De Sorbiere being informed of the charge againſt him of having aſſumed the character of deputy from the academy of Monſieur De Montmor to the Royal Society, wrote a letter to Mr. Oldenburg from Paris on the 5th of December 1663, N. S.[*] appealing to him for his juſtification in that article, expreſſing at the ſame time his high ſenſe of the honour done him by the Royal Society, in electing him into their body; and deſiring ſome account of their eſtabliſhment, and a copy of their ſtatutes, when printed or an abſtract of them, to be made uſe of in a relation, which he was drawing up of his voyage to England. Mr. Oldenburg, in his anſwer, dated at London January 3, 166$\frac{3}{4}$[†], ſent him the ſubſtance of his letter to Monſieur Petit; and after informing him, that Mr. Boyle's treatiſes on *Colours* and *Cold*, and Dr. Willis's *Anatome Cerebri* would ſoon be publiſhed, excuſed himſelf from anticipating the hiſtory of the eſtabliſhment of the Royal Society, which was ready to be committed to the preſs by one of their friends; and was undoubtedly that four years after publiſhed by Mr. Sprat.

[*] Letter-book, vol. i. p. 121.

[†] Ibid. p. 122.

" Bettele (ſo called by the Portugueſe) or Seeree (according to the Malayan " language) is eſteemed abundantly wholſome by all people in thoſe parts, being " eaten with a little fine flaked lime, and a quarter or half of Arecca or Benang- " nut. Without it, the natives could hardly ſubſiſt, for their food conſiſting chiefly " of boiled rice, fruit, fiſh, *&c.* they find this very comfortable to the ſtomach, " and much conducing to a good digeſtion; and the chewing of it may be well " thought a good expedient for the extinction of thirſt: for the natives (though " in this hot climate) drink very little, only waſhing their mouths with water, " after chewing of the ſaid Seeree, and after their tobacco (which for calefying " their ſtomach they often take). But it is obſerved, that thoſe, that uſe it much, " ſeldom have any teeth in their heads, or none good, after thirty years of age, " which is imputed to the heat of the lime; yet, for the aforeſaid reaſon, and " prevention of an offenſive breath, they all uſe it: and that it hath this latter " quality is moſt evident; for in their Poaſſa (which anſwers to our Lent) when " it is not lawful for any to eat from ſun-riſing to ſun-ſetting, their breath is " very noiſome; inſomuch, that ſpeaking to one another, they will hold a clout " before their mouths. This alſo, being well mixed, giveth a pleaſant red tincture " to the lips, and more or leſs, according to the quantity of the lime. Inſtead " of the leaf, the people in the Celebes often eat a fruit called Seeree-boa (which " is much like to long-pepper in view) being dipped in oil, rolled in lime, and ſo " dried, for its better preſervation. This giveth a more pleaſing taſte, and maketh " a fragrant breath; and being eaten in England, with a little lime and ſome old " benang (for that the young will not keep till it come home) I believe it will " have the ſame operation.

" Arbor-triſte receiveth its name from its nature, whilſt (as it were) diſconſolate " in the day, it only ſpreads its flowers after ſun-ſet, and ſheds them all before " ſun-riſing. One of theſe I myſelf have ſeen at Batavia, and obſerved. The flower " is a ſmall white flower, with orange-coloured ſprays in the middle, pretty to the " eye, and not unpleaſing to the ſmell. Of any water diſtilled from them I never " ſaw, and ſhall therefore therein plead ignorance.

" Poiſon, that which ſo famous is, under the notion of Macaſſar-poiſon, is made " on the Celebes, by a people inhabiting the mountains, which run through the " heart of that iſland, and are called Traia-people. The ingredients I could never " yet diſcover, but ſuch is the effect, that a ſmall arrow being imbued with it, " giveth a fatal wound, if it draw blood in any place, and is incurable; the beſt " antedote being human ordure, which being crammed down the throat, enforceth " ſo ſtrong a vomit, that it often cureth. And for this purpoſe, the Dutch offi-

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[m] Original Regiſter, vol. ii. p. 313.

“ cers many times command their ſoldiers, engaging in an enemy's country, to
“ carry with them their own excrement. The natives are very chary to preſerve
“ it from the air, inſomuch, that it is almoſt incredible, with how warm cloths
“ they wrap it and rub it: yet have I ſeen a Malayan ſwallow down pills of it,
“ pretending it antidotal; and a Traia-man, after a wounded fowl had been killed
“ by the venom of that poiſon, cut out a little of the ſurroundng fleſh, and ſo
“ dreſſed the wounded fowl and eat it.

“ Camphire is credibly reported to be the gum of a tree: I myſelf have had
“ cabinets made of camphire-wood, which have a very ſtrong ſcent.

“ Bird's neſts, about divers of the iſlands in the South-ſeas, are found amongſt
“ the cliffs and rocks, a ſort of tough thing, much like a bird's neſt, and almoſt
“ tranſparent; uſed as a delicious food; and from their reſemblance or nature,
“ called by the natives, Bird's neſts: And indeed, the moſt credible opinion is,
“ that they are really the neſts of birds, which ſitting on their own eggs (which
“ there lie in great heaps) make ſuch an impreſſion on them, the ſhell decaying,
“ or being caſt out, and the yolk and white blended together, in that form.
“ And thus the natives affirm it.

“ Rhinoceros-horn is eſteemed antidotal, and of much value among the Chi-
“ neſe, if carved into drinking cups, of which I myſelf have now three, ſo rarely
“ cut, that I value them above twenty rixdollars apiece. If the horn be good,
“ and any filthy or venomous liquor be put in it, you will perceive the water to
“ bubble up with a gentle ſuſurration.

“ Pedra de Porco is a precious light ſtone, found in a hog (as bezoar in a
“ goat, *&c.*) principally at Timor and Solor, of a very bitter taſte, and eſteemed
“ incomparably above bezoar.

“ Ambergriſe is chiefly found in the South-ſeas, about the ſmall iſlands of
“ Titmor and Tenimbar, Serera and Aru; is principally expoſed to ſale by the
“ poor exiles Bandaneſe, who uſe the trade of thoſe parts to get a little mainte-
“ nance; and thoſe men do aver, that the grey amber is the excrement of a
“ very great fiſh; and the white its evomition: and that the natives obſerving
“ ſuch fiſh to viſit the coaſt, do diligently take notice, when they ſee them duck
“ their heads, and void backwards; or erect their heads, and vomit forwards:
“ and thereupon viſit, with their ſmall boats, the adjoining rocks and ſhores,
“ where they find it in huge great lumps, lay it in the ſun to harden it, and then
“ cutting into ſmall pieces, divide it into reſpective ſhares.”

Sir ROBERT MORAY cauſed to be brought two bottles, well ſtopped, of Thames-water, ſent by him to the Eaſt-Indies, and returned from thence; which being opened, had ſomething of the ſmell of pump-water in ſhips. It was recommended to Dr. GODDARD to make ſome trials of it; 1. by way of diſtillation, to ſee what ſpirit it would yield; 2. by approaching a flame to it, to ſee whether it would burn; 3. by putting it into the engine in ſome glaſs cane, to ſee whether it had as much air in it as ordinary water, *&c.*

He gave an account of the two pendulum-clocks ſent by Major HOLMES into the Streights, and now returned; *viz.* that they were preſumed to have gone equally even in the rough ſeas. It was ordered, that the ſaid clocks ſhould be recommended again to the major, for reiterating the experiment in his next voyage; and that they ſhould be hung croſs. The account of the going of the two watches, from the 28th of April to the 4th of September, 1663, was ordered to be regiſtered [a].

The operator produced the dog, a piece of whoſe ſkin had been cut off and ſewed on again; and he related, that as ſoon as the ſkin was cut off, it ſhrunk into half its dimenſions, ſo that they could not ſtretch it out ſo far as to cover the whole fleſh with it, as it had done before; but yet it looked as if it would grow on again. The whole proceſs was ordered to be given, in writing, by Mr. HOOKE.

The operator produced again the thermometers with ſpirit of wine, and ſaid, that they all did agree at the figure 8. It was ordered, that one of them ſhould be kept by the Society as a ſtandard, and all the reſt ſo adjuſted, as to agree therewith.

One of theſe thermometers was ordered to be given to Mr. WATERHOUSE for Mr. CHILDREY; another to Dr. CROUNE for Dr. POWER; a third to the ſecretary for Mr. BEAL.

Mr. HOOKE ſhewed a hygroſcope, made of the beard of a wild oat, advancing and returning according to the dryneſs or moiſture of the weather.

He likewiſe produced the microſcopical obſervation of a part of a fly's wing.

Dr. WALLIS's account of the new way of hatching pigeons being again taken notice of, Sir ROBERT MORAY related, that the king, when very young, meeting with a black-bird's neſt, and finding but one young one in it, carried it home in the neſt, and put it to a thruſh in a cage, who fed the black-bird as carefully, as if it had been her own, but with this difference, that whereas other birds feed their young ones firſt before they feed themſelves, the thruſh fed herſelf before the black-bird.

Dr. HOLDER mentioned, that he had ſeen roaches having both milt and ſpawn.

Dr. ENT affirmed, that ſeveral frogs had both milt and ſpawn.

The preſident acquainted the Society, that he had made the mercurial cylinder ſtand at 55 inches with very little water; and propoſed to proſecute the experiment.

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[a] Ibid. p. 304.

Sir ROBERT MORAY promiſed to ſend in a piece of copper ore brought from Sweden. And every member of the Society, who had had the opportunity, was deſired to bring in ores of ſeveral kinds, to be put into their repoſitory.

Mr. HOOKE was appointed curator for the ingrafting of feathers upon a cock's comb againſt the next meeting.

Mr. CLAYTON produced a kind of diamond, which being rubbed upon any glove or cloth, ſhone in the dark; and being warmed at a candle, glimmered to admiration.

October 26. At a meeting of the COUNCIL were preſent,

The lord viſcount BROUNCKER, preſident.
Sir ROBERT MORAY.
Mr. AERSKINE.
Dr. WILKINS.
Dr. GODDARD.
Mr. EVELYN.
Mr. PALMER.
Mr. HILL.
Mr. OLDENBURG.

The 1ſt and 2d ſtatutes of chap. 11, concerning the allowance and buſineſs of curators by office, paſſed the firſt time.

It was ordered, that Dr. WILKINS and Dr. GODDARD draw up a ſtatute for the duty of the printers of the Society.

October 28. The COUNCIL met again, there being preſent,

The lord viſcount BROUNCKER, preſident.
Sir ROBERT MORAY.
Mr. AERSKINE.
Dr. WILKINS.
Dr. GODDARD.
Dr. CLARKE.
Mr. PALMER.
Mr. HILL.
Mr. OLDENBURG.

Th 1ſt and 2d ſtatutes of chap. 11, concerning the allowance and buſineſs of curators by office, paſſed the ſecond time.

The commiſſion for the printers to the Society was read, and Mr. PALMER was deſired to adviſe with Mr. ELLISE concerning the form of it.

At a meeting of the SOCIETY on the ſame day, the preſident reported to them from the COUNCIL, that becauſe the ſtationers and printers are of one and the ſame company, and may, by the confeſſion of both ſides, practiſe both trades promiſcuouſly, the Society might chooſe a ſtationer for their printer, without any violation to their charter, which gives them power to chooſe printers. Whereupon Mr. JOHN MARTYN and Mr. JAMES ALLESTRY being recommended to the Society, it was put to the queſtion, whether it ſhould be the queſtion, that the office of printer to the Royal Society ſhould be conferred on the ſaid Mr. MARTYN and Mr. ALLESTRY jointly; and it was carried in the affirmative: after which, thoſe two perſons were put to the ballot, and choſen.

Archibald earl of Argyle was propoſed by Sir Robert Moray for a fellow of the Royal Society, and, by reaſon of his quality, choſen the ſame day unanimouſly.

Mr. Thomas Coxe was propoſed a candidate by Mr. Boyle.

Mr. Hooke was charged to provide, from time to time, ſuch experiments for the compreſſing engine, as he ſhould think proper.

He ſhewed a microſcopical obſervation of a piſmire.

He was deſired to take care and give directions, that Major Holmes might be furniſhed with a dozen of his new balls with leads for ſounding.

The operator was ordered to make ready the engine for the trials of gunpowder; as alſo a thermometer and a mercurial cane, to be ſent with Major Holmes; and thermometers for Capt. Taylor, Mr. Winthrop, and the governor of St. Helena.

Mr. Hill was deſired to take care of ſome Thames-water, to be ſent in bottles of white glaſs with glaſs ſtopples to the Eaſt-Indies, to obſerve the better the change of the colour of the water.

He was appointed curator for having ſome rain and river water brought from Guinea, it being affirmed, that the waters of that country are liable to putrefy ſooner than thoſe of this part of the world.

Dr. Wallis was deſired to conſider, what inquiries might be ſent and recommended to the Engliſh governor of St. Helena.

Sir Robert Moray produced ſome horſe-teeth petrified, brought by prince Rupert out of Germany.

He produced alſo a piece of copper-ore, ſent him out of Sweden, and preſented to the Society for the repoſitory. It was ordered, that Mr. Hooke, as keeper of the repoſitory, ſhould always affix ſome note to the things in it, by which it might be known what they are, and by whom they were preſented.

Sir Robert Moray was deſired to inquire of his friend in Sweden, what variety of copper-ore there is in that kingdom, and how rich they are?

Dr. Charleton, Dr. Croune, and Mr. Hooke, were again appointed curators of the experiment of planting a cock's ſpur on a cock's head; and the operator was ordered to provide a fit cock for it againſt the next meeting.

Dr. Charleton was alſo deſired, together with Mr. Hooke, to repeat the experiment of cutting off a piece of a dog's ſkin, and ſewing it on again: and the operator was ordered to provide another dog for that purpoſe.

The

The operator tried the experiment of making feathers grow upon a cock's comb, with the mixture of bole-armoniac and the white of an egg.

Mr. BOYLE delivered in a paper, containing his obſervations upon Mr. CLAYTON's diamond; which was ordered to be regiſtered [*].

November 2. At a meeting of the COUNCIL were preſent,

The lord viſcount BROUNCKER, preſident.
Sir ROBERT MORAY.
Mr. AERSKINE.
Mr. BALLE.
Mr. HENSHAW.
Dr. WILKINS.
Dr. GODDARD.
Dr. CLARKE.
Mr. PALMER.
Mr. HILL.
Mr. OLDENBURG.

Mr. PALMER reported from Mr. ELLISE, that the draught of the commiſſion for the printers of the Society was in good form.

The ſaid commiſſion paſſed as follows:

"The preſident, council, and fellows of the ROYAL SOCIETY of London for improving natural knowledge, to all perſons, who ſhall read or hear theſe preſents greeting. Whereas by his majeſty's charter under the great ſeal of England, is given and granted to us full power and authority, to chooſe one or more printer or printers, for matters and affairs relating unto or concerning the ſaid Society, we do, by theſe preſents, declare JOHN MARTYN and JAMES ALLESTRY, citizens and ſtationers of London, jointly choſen, in due manner and form, according to the ſaid charter, to the office of printer to the Royal Society aforeſaid, according to the ſaid charter, ſworn to deal faithfully and honeſtly in all things belonging to the truſt committed to them, as printers to the ſaid Society, during their employment in that capacity. And we do, by theſe preſents, give and grant unto the ſaid JOHN MARTYN and JAMES ALLESTRY full power and privilege to print all ſuch things, matters, and buſineſſes, concerning the Royal Society aforeſaid, as ſhall be committed unto them by the preſident and council of the ſaid Society, or any ſeven or more of them (whereof the preſident always to be one) or by the major part of the ſaid ſeven or more. And we do farther give and grant unto the ſaid JOHN MARTYN and JAMES ALLESTRY, that no other perſon (except any duly choſen and ſworn as aforeſaid) ſhall print any of the ſaid things, matters, and buſineſſes, concerning the Royal Society aforeſaid, they, the ſaid JOHN MARTYN and JAMES ALLESTRY, duly obſerving all the orders and directions of the preſident and council, or the ſaid ſeven or more of them aforeſaid, concerning the printing of all the ſaid matters and buſineſſes. In witneſs whereof, we have cauſed our common ſeal to be affixed unto theſe preſents, and the ſame to be ſigned by the preſident of the Royal

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[*] Original Regiſter, vol. ii. p. 316. It is printed, with Mr. BOYLE's Experiments and conſiderations concerning colours, at London, 1665, in 8vo.

"Society aforeſaid, this thirteenth day of January, in the fifteenth year of our
"ſovereign lord **Charles** the ſecond, by the grace of **God**, of England, Scotland,
"France, and Ireland, king, defender of the faith, *&c. annoque Domini* 1663."

It was ordered, that the operator deſire Mr. **Martyn** and Mr. **Allestry** to attend the Council on the Monday following, to receive their commiſſion, and to hear the ſtatutes concerning their duty, and to be ſworn as printers to the Society; they having no exception againſt ſuch commiſſion and ſtatutes.

The ſtatute of the duty of the printers, as alſo the ſtatute of a certain number of printed copies to be preſented by the printers of the Society, both paſſed the firſt time.

November 4. At the meeting of the Society,

The earl of **Argyle** was admitted.

Mr. **Thomas Cox** was elected.

The ſtatutes of the Society were publiſhed.

Dr. **Wilkins** preſented the Society with ſeveral things for their repoſitory: 1. A wind-gun. 2. A burning-glaſs, in a braſs frame. 3. Another burning-glaſs, in a wooden frame. 4. Scales for weighing of gold without any counterpoiſe. 5. A ſtrange bone, with a rib in the middle. 6. A geometrical arch, compoſed of many ſmall pieces of wood, without any nails or pins. 7. A loadſtone, then in the hands of Sir **William Persall**, and ordered to be called for by the operator. 8. A large concave metal. 9. A cylinder metal. 10. An angular metal. 11. A blue concave glaſs. 12. A piece of petrified wood. 13. A cocoa-nut. 14. An oſtrich's egg-ſhell. 15. A piece of perſpective. 16. Two papers of petrified graſs. The operator was ordered to fit the wind-gun, and to poliſh and varniſh the burning-glaſs. The preſenter of theſe things received the thanks of the Society; and it was ordered, that he be regiſtered as a Benefactor; together with prince **Rupert**, for his water-engine; the biſhop of Exeter [p], for his pendulum-clock; Mr. **Boyle**, for his pneumatic-engine; Sir **Heneage Finch**, ſolicitor-general, for remitting the fees due to him for the Society's charter; and Dr. **Bate**, for a preſent of ten pounds.

The hiſtory of whale-fiſhing, and of the making of whale-oil, was delivered in by the ſecretary from Mr. **Gray** of the Greenland company, who had been in thoſe parts, and preſent at the killing of whales and the making of oil a dozen times; and was ordered to be regiſtered [q], as follows:

"We have, according to the bigneſs or ſmallneſs of our ſhips, the more or fewer "boats: a ſhip of 200 tuns may man ſix boats; a veſſel of 80 or 100 tuns, four

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[p] Dr. Seth Ward.

[q] Original Regiſter, vol. ii. p. 308.

“ boats; a veſſel of 60 tuns, three boats, or more, not leſs; three boats being as few as may be with convenience to kill a whale. Each boat hath ſix men, a harponeer, a ſteerſman, and four oars; to which men the merchant giveth (beſides their wages) for every thirteen tuns of oil (which we call a whale when there is ſo much for each boat, to the harponeer 6l. 10s. the ſteerſman 3l. and to each oar 1l. 10s. in all for each boat 15l. 10s. which we call whale-money.

“ We have ſeveral men and boats upon ſeveral convenient places, which we call *Look-outs*, that conſtantly remain looking out by turns for the whale, which, when we fiſh in harbour, cometh into a ſmooth bay, where is a good harbour for our ſhips: and having diſcovered the whale, which ſwimmeth with her back above water, or is deſcried by the water, which ſhe bloweth into the air, one look-out maketh ſigns to another by hoiſting up a baſket upon a pole, and then all the boats row after her; and having opportunity to row up with her, before ſhe goweth down, ſtrike a harping-iron into her, to which is a ſtaff joined, being about ſix foot long, called a harping-ſtaff, to the ſocket of which iron is a white rope, with an eye ſeized very faſt. This rope is about five fathom long, lying upon the fore-part of the boat (which we call a ſhallop) always coiled over a little pin, ready to take up, to give ſcope to the iron, when it is thrown at the whale; and to this hand-rope is a warp of 300 fathoms ſeazed, to veer after the whale, leſt, when ſhe is ſtruck, by her ſwift motion (which is often down to the ground, where the water is 60, 70, or 80 fathom deep) ſhe ſhould ſink the boat.

“ Thus having gotten one iron into her, our boats row where they think ſhe will riſe (after ſhe hath been beating herſelf at ground) and get two or three irons more into her, and then we account her ſecure. Then when ſhe is near tired with ſtriving, and wearied with the boats and ropes, we lance her with long lances, the irons and ſtaves whereof are about twelve or fourteen foot long, with which we prick her to death; and in killing her, many times ſhe ſtaveth ſome of our boats, beating and flouriſhing with her tail above water, that the boats dare ſcarce come nigh her; but oftentimes in an hour's time ſhe is diſpatched.

“ Thus having killed her, our boats tow her (all of them rowing one before another, one faſt to another like a team of horſes) to the ſhip's ſtern, where, after ſhe hath lain twenty four hours, we cut off the blubber, and take the fins (which we commonly call the whale-bone) and her tongue out of her mouth, and with a great pair of ſlings and tackle we turn her round, and take all that is good off her, and then we turn her carcaſs a-drift, and tow the blubber (cut in pieces) to the ſhore, where works ſtand to manure it.

“ Having made faſt the blubber to the ſhore, we have a water ſide-man, who ſtands in a pair of boots to the middle leg in water, and flaweth ſuch fleſh as is not clean cut from the blubber. Then we have two men with a barrow, that, when the water-ſide man hath cut it in pieces of about two hundred weight, carry it up to a ſtage ſtanding by our works like a table; then we have a man with a 'long knife, who we call a ſtage-cutter, who ſliceth it into thin pieces about half 'an inch thick, and a foot long, or longer, and throws it into a cooler we call a 'ſlicing-cooler, betwixt which and another cooler (called a chopping cooler) we 'have men we call choppers placed; five or ſix men, who upon blocks cut about 'a foot and an half ſquare (made of the tail of the whale, which is very tough) do "take the ſliced blubber and chop it very ſmall and thin, not above a quarter of "an inch thick, and an inch or two long, and thruſt it off from their blocks into "the chopping-cooler, which holds two or three tuns. Then upon a plat-form "is built a copper-hole about four foot high, to which there is a ſtoke-hole, and "on this copper-hole is a broad copper, which containeth about a butt, hanged "with mortar and made tight roand the edges. And over the ſtoke-hole, upon "an arch, ſtands a chimney, which draws up the ſmoak an flamed. And we have "one we call a tub-filler, who with a ladle of copper, whoſe handle is about ſix "foot long, taketh the chopt blubber out of the chopping-cooler, and puts it into "a hogſhead made with ſtraps for that purpoſe; and he draws this hogſhead "from the chopping cooler's ſide to the copper, and putteth it in; under which "having once kindled a fire of wood, and boiled a copper or two of oil, the ſcarf, "which remains after the oil is boiled out of the blubber (which we call fritters) "we throw under the copper, which makes a fierce fire, and ſo boileth the oil out "of the blubber without any other fewel.

"Then when we find that it is boiled enough, we have two men, whom we call "copper-men, who with two long-handled copper-ladles take both oil and fritters "out of the copper, about half, and put it into a barrow (we call a fritter-barrow) "made with two handles, and barrel-boards ſet about half a quarter of an inch one "from the other, through which the oil runneth and the fritters remain; from "which the oil being drained, whilſt another copper of oil boils, they are caſt into "the ſtoke-hole and burnt, and the barrow ſtands ready again on the firſt oil-"cooler, to receive what is taken out of the next copper. Out of this barrow the "oil runs into a great thing we call a cooler, made of deal-boards, containing "about five tuns, which is filled within an inch of a hole (made in the ſide for the "oil to run into the next ſpout) with water to cool the oil, and ſo the oil runs "upon the water through this hole into a ſpout about ten or twelve foot long, "into another cooler filled as aforeſaid, and out of that through a long ſpout into "a third filled as aforeſaid, and out of that in a long ſpout into a butt laid under "the end of this ſpout; which being full, the hole of the cooler next the butt is "ſtopt till another butt is laid under, and then the plug being taken out it filleth "another, till we have done boiling. Then we fill up our oils, when they are "thoroughly cold, and mark them and roll them into the water, rafting twenty "together, and ſo tow them aboard, hoiſt them into our ſhips, and ſtow them to "bring them home.

"And for our fins, which grow in two gums in the whale's mouth (whereof in "a whale's mouth, great and ſmall, are about 600, 460 whereof being mer-"chandable) we cut them one by one out of the gums, and having rubbed them "clean, we bind them up ſixty in a bundle, and ſo taking account of them, ſhip "them aboard in our long boat.

“ Upon the ſhore we have a tent for our land-men, built of ſtone, and covered “ with deals, and cabbins made therein for our blubbermen to lodge; and we “ have a great working tent with a lodging-room over it, where about ſix coopers “ work, to get ready caſks to put the oil into.”

Sir ROBERT MORAY moving, that it might be conſidered, whether there might not be deviſed an engine fit to ſtrike the whales with more eaſe and ſureneſs, and at a greater diſtance than thoſe now in uſe, it was ordered, that Dr. WILKINS and Mr. HOOKE ſhould think of ſuch an engine, that might be cheap and eaſy to be managed.

Mr. HOOKE ſhewed ſome microſcopical obſervations of, 1. A mite. 2. Sparks of a flint. 3. Hairs of a man's head, of a cat, and of a horſe, and ſome briſtles.

Mr. HOWARD mentioned ſomething of the care taken by him for the propogating of ſaffron, and of ſeveral obſervations made by him concerning it; deſiring, that ſome members of the ſociety might be joined with him for the proſecution of this work. Whereupon Mr. BOYLE, Mr. EVELYN, and Mr. HENSHAW were deſired to do ſo, and himſelf was requeſted to communicate his notes aforeſaid to the ſociety.

Mr. BOYLE ſuggeſted, that the oil of turpentine or ſpirit of wine was good to keep birds, and the firſt better than the ſecond for that purpoſe.

Dr. CROUNE communicated a letter written to him by Mr. NEWBURGH, and dated October 31, 1663, about the fertiliſing of barren orchards by turning cattle into them, and foddering them all the winter. An extract of this letter was ordered to be entered[1], as follows:

“ I cannot let paſs one experiment newly made by a perſon of quality in Hampſhire, for the fertiliſing of his orchard, which, after near thirty years barreneſs, “ was ſuddenly made wonderouſly (it is ſaid conſtantly) fruitful. About four or “ five years ſince there came to his houſe an honeſt plain man, who obſerving a “ great orchard well filled with handſome trees, in a manner totally fruitleſs (for, “ as I remember, out of four acres of ground ſet with fruit-trees, ſet at twelve or “ fourteen feet diſtance, he never made an hogſhead of cider till within theſe two “ laſt years) he was perſuaded by him, after fruitleſs trial of all other remedies, to “ turn his cattle into the orchard, and to fodder them there all the winter: which “ advice neglecting for ſome years, upon a ſecond mention by another hand, the “ winter immediately preceding the laſt, he made his firſt trial of it, which ſped “ ſo well, that in that great bearing year he made above twenty hogſheads of “ cider, reſerving a great quantity for hoard. Doing the ſame laſt winter, his “ ſucceſs was again ſo nearly anſwerable to the former, that when I was there, he “ had made already above eighteen hogſheads, and conceives (though he finds “ this generally a failing year) he had more apples for number this year than the “ former; only ſo much ſmaller, that they did not fill the buſhel as before.”

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[1] Letter-book, vol. i. p. 93.

Dr. WALLIS was deſired to proſecute the obſervations of the ſatellites of Jupiter begun by Mr. ROOKE.

Mr. HOOKE was deſired to try the new ſounding balls in the Thames for major HOLMES, and to give an account of the ſucceſs to the ſociety.

Mr. BOYLE acquainted the ſociety, that he had made more obſervations with Mr. CLAYTON's diamond, which he intended to add to the former; and that, among the reſt, he had cauſed ſome coruſcations in it by pricking it with a bodkin.

Dr. CHARLETON made the experiment of grafting a cock's ſpur upon a cock's comb; and was deſired to take care of the ſucceſs, and to give an account of it in writing.

The operator was ordered again to provide another dog for Dr. CHARLETON to cut off a piece of his ſkin, and to ſew it on again.

November 9. At the COUNCIL were preſent

The lord viſcount BROUNCKER, preſident.
Sir ROBERT MORAY.
Sir PAUL NEILE.
Mr. AERSKINE.
Mr. BALLE.
Mr. HENSHAW.
Dr. WILKINS.
Dr. GODDARD.
Mr. PALMER.
Mr. HILL.
Mr. OLDENBURG.

It was ordered, that the amanuenſis make a liſt of all the fellows of the ſociety, without the members of the council, in four columns, and another of all the members of the council in a column by themſelves; and that he deliver them to the printer of the ſociety to be printed accordingly.

It was likewiſe ordered, that the ſummons for the anniverſary election ſhould be iſſued in the manner following:

> "These are to give notice, that on Monday the 30th day of this inſtant November, 1663, being St. ANDREW's day, the council and officers of the Royal Society are to be elected for the year enſuing; at which election your preſence is expected at Greſham-College, at nine of the clock in the forenoon preciſely.
>
> "BROUNCKER, P. R. S."

JOHN MARTYN and JAMES ALLESTRY had the commiſſion of eſtabliſhing them printers to the ſociety, as alſo the two ſtatutes concerning the duty of printers, delivered to them, to conſider thereof. They having withdrawn for that purpoſe, and upon conſideration having no exception to any thing contained in the ſaid commiſſion and ſtatutes, were ſworn printers to the ſociety.

The ſtatute of the duty of the printers, and the ſtatute of a certain number of printed copies to be preſented by the printers of the ſociety, both paſſed the ſecond time.

November 11. At a meeting of the Society

Mr. Francis Potter and Mr. Thomas Coxe were admitted.

The following perſons were voted by ballot a committe to examine, according to ſtatute, the treaſurer's accounts, Sir Anthony Morgan, Dr. Wallis, Mr. Colwall, Mr. Aubrey, and Mr. Hoskyns: and it was ordered, that they, or any three or more of them, ſhould meet for this purpoſe at Sir Anthony Morgan's lodgings on the Saturday following, the 14th inſtant, at three of the clock in the afternoon, and to bring in their report a fortnight after, being the 25th of November, at the ordinary meeting of the ſociety.

Mr. Gomeldon the elder was elected into the ſociety.

Sir Robert Moray preſented from prince Rupert to the ſociety an inſtrument of his highneſs's invention for caſting any platform into perſpective. It was ordered, that the Preſident, Sir Robert Moray, Mr. Aerskine, Dr. Wilkins, Dr. Wallis, Dr. Goddard, and Mr. Oldenburg wait upon the prince on the Friday following, the 13th inſtant, and return him the humble thanks of the ſociety; and to ſhew him an inſtrument of Dr. Wren's invention for caſting any natural object into perſpective.

Mr. Hooke ſuggeſting, that additions might be made to the ſaid invention of prince Rupert, ſo that it might incline and recline, and be fitted to draw likewiſe ſolid bodies in perſpective, and to deſcribe all kind of dials, was deſired to bring in theſe additions in writing, and then to give a deſcription, and to ſhew the practice of the whole. In the mean time it was ordered, that the prince's inſtrument ſhould remain ſimple, as it was then, without any alteration therein.

Mr. Clayton's diamond being again ſpoken of, the preſident mentioned, that he had one upon his finger, which being without clouds, would ſhine notwithſtanding, when rubbed in the dark. Mr. Hooke added, that he had a ring with ſix ſmall diamonds, which would all do the like, but continue for a very little time. And Mr. Boyle related, that he was credibly informed of a certain ſtone brought by an admiral of the Dutch fleet from the Eaſt-Indies in a cheſt, which ſtone ſhone ſo, when the cheſt was opened in the dark, that by it they could ſee all that was therein beſides. Sir Anthony Morgan ſpoke concerning cliffs in Scotland, which, by the relation of many perſons, on their weſt ſide, would give a great light in the dark. This was confirmed by Sir Robert Moray, who was deſired to make a more particular inquiry into it, which he undertook to do.

Sir Robert Moray mentioned, that prince Maurice of Naſſau had a conſiderable ſhining ſtone; and Mr. Povey was deſired to write into Holland for the favour of a particular information concerning it; which he promiſed to do.

Mention was alſo made of the Bononian ſtone, concerning which Mr. BOYLE affirmed, that, if it were very good, it would ſhine without the ſun by a candle, or in a cloudy day. He moved alſo the making a trial, whether the Bononian ſtone might be made to ſhine without calcining it. Mr. HENSHAW mentioning, that he had one, which had once the quality of ſhining, but loſt it; it was queried, whether a way might not be found to recover that quality; that gentleman affirming, that rotten wood, which had ſhined, would, upon its being expoſed to the fire, and growing dry, loſe its ſhining quality, but after two or three days regain it. Sir ROBERT MORAY queried what degree of putrefaction made fiſh or wood ſhine? Mr. BOYLE conjectured, that the ſhining of thoſe bodies, and the loſs of their ſhining, depended upon a ſlight change of their texture.

Mr. CLAYTON promiſed to bring ſome of the Bononian ſtone to the next meeting.

Dr. WILKINS moved, that a collection might be made of all ſuch bodies as ſhine in the dark; and Mr. BOYLE having remarked, that he had ſome ſuch collection amongſt his writings, was deſired to communicate it to the ſociety, and to conſider the cauſe of this phænomenon.

Dr. WILKINS produced an inſtrument and paper of Dr. POWER, repreſenting and deſcribing the Copernican motion of the ſun upon its axis, *&c.* They were both delivered to the operator, to put the inſtrument into order, and it was referred to Mr. HOOKE to ſee, whether it would anſwer the intention.

Sir ROBERT MORAY mentioned a new way of carriage invented in France by the duke of ROANEZ, for riding with much eaſe as ſwift as a poſt over all kinds of ground, without concuſſion or danger of falling; and that the inventor was now taking out a patent for it. This occaſioned Mr. HOOKE to preſent to the ſociety a ſcheme of an inſtrument to walk in upon the land or water, with ſwiftneſs, after the manner of the wheel of a crane. Several objections being made to this propoſition, it was judged proper, that it ſhould be farther conſidered; and if, upon ſecond thoughts, it was conceived probable for ſucceſs, a model ſhould be made of it.

Mr. HOOKE ſhewed the ſcheme of another engine for carriage, *viz.* of ſuch a one, as goes with one wheel, and is drawn by one horſe, ſo contrived, that it ſhall not fall, but be kept perpendicular, what way ſoever it moves, even on the declivity of a hill, *&c.* He was deſired to have a model made thereof.

He being aſked, whether he had tried his new ſounding balls for major HOLMES, ſaid, that he had tried them, and found them to do exceeding well. Oozy ground was obſerved to be moſt likely to make them unſucceſsful.

Mr. POVEY mentioned, that Mr. JONAS MOORE had an engine for ſtaying two or three hours under water in; and likewiſe a method of blowing up great rocks; both practiſed by him at Tangier. The propoſer was deſired to bring either the artiſt to the ſociety, or a deſcription of theſe two practices in writing; which he promiſed to do.

Mr. Hooke ſpoke of a way of carrying air down to the bottom of the ſea at any depth, and of bringing it up, under a bell. He was deſired to give in a particular deſcription of it.

Sir Robert Moray mentioned a new uſe to be made of thermometers, *viz.* to know by their help the degrees of heat in a man's body in fevers, *&c.* by putting it into a man's hand, or mouth, or urine, *&c.* The phyſicians preſent conceived, that there would be little certainty in it.

He acquainted the ſociety, that major Holmes was again charged with the two pendulum clocks in his voyage to the Weſt-Indies, to try them the ſecond time, for an exact meaſure of time. as alſo, that the ſounding-balls mentioned above were committed to him to make trial with.

Mr. Boyle produced ſome vitriol, which he had made of the ore put into his hands by Sir Robert Moray, at the deſire of the ſociety; and he affirmed, that he had made it ſhoot very well into this copperas, without any addition at all. It was well coloured, and thought not inferior to Dantzick vitriol. It coloured a knife.

Sir Robert Moray was deſired to procure more of the ſame mineral for farther trial; which he promiſed to do from Col. Long.

Dr. Goddard mentioned, that he had diſſolved manna in fair water, and found it ſhoot into very fine cryſtals.

Mr. Boyle ſaid, that he had diſſolved ambergriſe, and made it cryſtalize in very curious figures.

Mr. Hooke was appointed to provide a good experiment in the compreſſing engine againſt the next meeting.

The operator was ordered to have a dog ready for the next meeting, to cut off a piece of his ſkin. The curators appointed for this were Dr. Croune and Mr. Hooke.

November 16. At a meeting of the Council were preſent

The lord viſcount Brouncker, preſident.	Dr. Wilkins.
Sir Robert Moray.	Dr. Goddard.
Sir Paul Neile.	Dr. Ent.
Mr. Slingesby.	Dr. Clarke.
Mr. Aerskine.	Mr. Palmer.
Mr. Balle.	Mr. Hill.
Mr. Henshaw.	Mr. Oldenburg.

It was ordered, that Mr. Balle acquaint Sir Willam Persall, that Dr. Wilkins had preſented his load-ſtone, now in the hands of Sir William, to the ſociety, and require him in the name of the council to deliver it to him for the uſe of the ſociety.

Mr. **Hill** brought in the inventory, drawn out of the treaſurer's bills, of the things belonging to the ſociety; which inventory was ordered to be delivered by the ſecretary to Mr. **Hooke**, as keeper of the repoſitory.

Dr. **Goddard** alſo brought in a liſt of the things committed to his cuſtody; which liſt was alſo ordered to be delivered to Mr. **Hooke**.

November 18. At the meeting of the **Society**, Monſieur **De Bruin**, of Antwerp, who had lived many years in England, ſkilful in jewels and metals, had, upon the motion of Mr. **Oldenburg**, the leave of the ſociety to be preſent at this meeting.

Henry earl of **Peterborough** was propoſed by the preſident, and immediately choſen and admitted into the ſociety.

Dr. **Willis** was elected, having been forgotten to be choſen, at the time when, upon the renewal of the charter, the council, according to the power granted them therein, received and admitted into the ſociety ſuch perſons, as had been elected fellows before upon the firſt charter.

Mr. **Gomeldon** the elder was admitted.

Mr. **Palmer** preſented the ſociety with a very artificial gun of **Caspar Calthof**'s contrivance, lodging at a time ſeven bullets and powder in proportion, and diſcharging them at ſeven ſeveral times. He had the thanks of the ſociety; and it was ordered, that he ſhould be regiſtered amongſt their benefactors.

Sir **Robert Moray** mentioned, that prince **Rupert** had contrived a gun exceeding all that had hitherto been invented of that kind, diſcharging ſeveral bullets with eaſe and without danger.

The account of the obſervations made in the glaſs canes with water of forty feet long, was brought in by the operator, and ordered to be kept till the preſident had brought in his account of the mercurial obſervations, and that then both be compared and digeſted, and all regiſtered.

The preſident was deſired to proſecute the experiments both of the ſuſpenſion of the mercury above its uſual height, and of the variations of its ſtation, according to the changes of the air.

Mr. **Hooke** ſhewed the ſociety his model for the whale-ſhooting engine. Some objections being made concerning it, it was ordered, that Dr. **Wilkins**, Dr. **Wallis**, and Mr. **Hooke** ſhould meet together on the Tueſday following, in the afternoon, to conſider farther of it.

Mr. HOOKE was put in mind to bring to the next meeting his additions to prince RUPERT's inſtrument of perſpective, and to make a full deſcription of it.

He was alſo ordered to make a paſte-board model of his engine with one wheel, to travel in with eaſe and ſpeed, and to ſhew it to the council at their next meeting; as alſo to prepare a model of his other engine, to travel in over land and water by walking in it, after the faſhion of the wheel of a crane.

Sir ROBERT MORAY was deſired to requeſt prince RUPERT to ſend his powder-tryer with a looſe and fixed ferrel to the ſociety, to try his experiments of the force of powder therein.

Mr. GOMELDON promiſed to ſhew the ſociety a diamond like that of Mr. CLAYTON's, but not ſhining in the dark upon being rubbed.

Dr. WILKINS, Dr. ENT, and Mr. HENSHAW were appointed curators for the recovery of the ſhining quality of a Bononian ſtone.

Sir ROBERT MORAY related, that he had ſpoken with the lady REAY concerning the ſhining cliffs in a little iſle in Scotland; and that ſhe told him, that her father and others of the family had heretofore often ſeen it, and had ſometimes ſhot at it with chalk to mark the ſhining place; but could never find the mark in the day-time after: that for twenty years ſhe had heard nothing of it; but ſhe would now make more particular inquiry after it, ſhe being ſhortly to go to Scotland herſelf.

November 23. At the meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER, preſident.
Sir ROBERT MORAY.
Sir PAUL NEILE.
Mr. AERSKINE.
Mr. HENSHAW.
Mr. BALLE.
Dr. WILKINS.
Dr. GODDARD.
Dr. ENT.
Mr. PALMER.
Mr. HILL.
Mr. OLDENBURG.

Mr. SYMMONDS brought in the manual ſeal, containing the creſt of the arms of the ſociety.

Dr. GODDARD had this ſeal delivered to him.

It was ordered, that the treaſurer pay to Mr. SYMMONDS the ſum of twenty-five pounds in full of his bill for both the ſeals of the ſociety, and the other particulars contained in that bill.

Mr. HOOKE produced a model of a new way of carriage with one horſe, after the faſhion of a wheel-barrow, deviſed by himſelf; and upon ſome debate it was ordered, that he ſhould farther conſider of it againſt the next meeting of the council.

November 25. At the meeting of the SOCIETY,

Mr. HOOKE brought in an account of his additions to prince RUPERT's perſpective engine; and it was ordered, that ſuch an engine ſhould be made for the uſe of the ſociety.

The committee formerly appointed to meet for the examining of the treaſurer's accounts, but not being yet ready for a report, was deſired to meet the next day at three o'clock in the afternoon at Mr. BALLE's lodgings, and to make a report on the Monday following, before the ſociety ſhould begin the election of a new council.

Mr. HOOKE acquainted the ſociety, that he had altered his thoughts about the whale-killing engine, conceiving now, that a croſs-bow of whale-bones might be ſo contrived, as to perform that execution well. Whereupon ſome of the members objecting, that whale-bones would by the water loſe their ſpring, it was ſaid, that good varniſh would ſecure the ſpring. Others ſuggeſted, that a bow of ſteel tinned over would do well, eſpecially if ſeveral thin ſteel ſprings were put together. Mr. HOOKE was deſired to conſider farther of this.

Dr. CHARLETON mentioning a peculiar kind of bow, which he thought might be had in Grub-ſtreet, was deſired to inquire after it, and to obtain the ſight of it for the ſociety; which he promiſed to do.

The preſident acquainted the ſociety, that he had received a letter ſent to a miniſter in England from a ſuffragan biſhop in Iceland; which letter being produced, the ſecretary was ordered to peruſe it, and give an account of it to the ſociety at their next meeting; againſt which time the amanuenſis was ordered to make a copy of the inquiries formerly * drawn up by Mr. HOOKE and ſent to Iceland, in order that they might be conſidered of, and fitted by the preſident to be ſent and recommended to the ſaid biſhop, as a perſon conceived to be capable and curious enough to return a proper anſwer to them.

The operator was appointed to rectify the thermometers, and to have one as a ſtandard to adjuſt others by.

Dr. WALLIS related the obſervations of a certain farmer concerning the weather, made by him for ſeveral years; whereby he had found, that the weather falling into a certain courſe at ſuch and ſuch a time of the moon in certain ſeaſons of the year, and chiefly about the equinoxes, it would for many ſubſequent months return to the like courſe at the ſame time of the moon, and for the moſt part not alter conſiderably therein during thoſe days till the next equinox.

Sir PAUL NEILE mentioned, that he had obſerved, that the neap-tides were accompanied with the drieſt, and the ſpring-tides with the wetteſt weather.

Mr. PALMER added, that watermen would prognoſticate rainy weather approaching, by a more than ordinary drineſs in their hands.

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* January 21, 166$\frac{2}{3}$.

Mr. Hooke produced his engine for determining the force of powder by weight: but it being found imperfect, by reaſon of the non-continuauce of the firſt impulſe, he offered to complete it, by the addition of a rammer.

Sir Robert Moray promiſing to procure, for the next meeting, prince Rupert's powder-tryer, the operator was ordered to provide ſeveral ſorts of powder for piſtols, muſkets, and cannon; and to make trial with all of them in the ſaid tryer.

Sir Paul Neile mentioned, that trial being made of prince Rupert's powder, and common Engliſh powder, it was found, that whereas a charge of the Engliſh powder ſhot through three boards, and ſtuck in the fourth, prince Rupert's powder paſſed through four boards, and ſtuck in the fifth.

Dr. Charleton promiſed to bring ſome of prince Rupert's powder.

Mr. Henshaw produced his Bononian ſtone, which had ſhined formerly, but now loſt that quality. He delivered it to Mr. Boyle, to ſee whether he could recover its ſhining faculty.

Mr. Boyle mentioned, that he had tried with ſpirit of wine, to draw out of putrefied fiſh its ſhining virtue, but without ſucceſs; but that he had done it with oil of vitriol with preſent ſucceſs, this oil having the power of altering the texture of that ſubſtance.

The experiment of cutting off a piece of a dog's ſkin was ordered to be deferred till a warmer ſeaſon.

The operator gave an account, that the old ſpur put on the cock's head was fallen off; but that the young ſpur, put on within the ſkin, and covered therewith, proved firm, and grew.

Mr. Povey being called upon for Mr. Jonas Moore's way of breaking rocks with powder, Sir Robert Moray related, from prince Rupert, the following way of blowing up rocks under-ground in mines, *viz.* by making a round hole in the rock eight or ten inches deep, or as deep as they can; and then, by taking two wedges, which put together make a cylinder diagonally cut, and by thruſting in the great end (after the powder is put in) and then by driving in the other end: which done, and fire being given to the powder by a train made in a groove in the wedges, the rocks are broken, becauſe the wedges cannot be thruſt out.

Mr. Hooke ſhewed a microſcopical obſervation of a ſilk-worm's egg.

The following experiments were appointed for the next meeting: 1. Of powder in prince Rupert's tryer. 2. Of the wind-gun. 3. Of the compreſſing-engine.

November 30. This being the anniverſary election-day of a new COUNCIL for the year enſuing, the Society met in a ſolemn manner.

Firſt, according to a former order, Sir ANTHONY MORGAN, in the name of the committee appointed for that purpoſe, made a report concerning the treaſurer's accounts, as follows:

November 26, 1663.

At a committee for examining and auditing the accounts of the treaſurer of the ROYAL SOCIETY of London, *&c.* in purſuance of their order, dated Nov. 11, 1663.

				l.	*s.*	*d.*
It appears, that from the 28th Nov. 1660, until the 11th Sept. 1663, there is due to the Society, by the ſubſcriptions of their members				685	11	0
	l.	*s.*	*d.*			
Of which hath been received by the treaſurer - -	527	6	6			
And there remains in arrears - - - -	158	4	6			
Diſburſed by the treaſurer, according to order of the Society - -				479	11	9
So there remains in the treaſurer's hands - - -	47	14	9			
Arrears unpaid by the members - - - -	158	4	6			
In all - -				205	19	3

Examined and approved by us,

ANT. MORGAN. JOHN WALLIS. JOHN HOSKYNS.
DAN. COLWAL. JOHN AUBREY.

This being done, the Society proceeded, according to their charter, to the election of the COUNCIL and officers for the year enſuing, obſerving the orders preſcribed for that purpoſe in their ſtatutes, there being preſent fifty-ſeven or fifty-eight fellows.

Of the old COUNCIL were continued the following eleven:

- The lord viſcount BROUNCKER.
- Mr. BOYLE.
- Sir ROBERT MORAY.
- Sir PAUL NEILE.
- Mr. AERSKINE.
- Mr. BALLE.
- Dr. WILKINS.
- Dr. GODDARD.
- Mr. PALMER.
- Mr. HILL.
- Mr. OLDENBURG.

The ten new ones elected were:

- The marquis of DORCHESTER.
- The lord BERKLEY.
- Mr. CHARLES HOWARD.
- Sir ANTHONY MORGAN.
- Sir PETER WYCHE.
- Mr. COLWALL.
- Mr. POVEY.
- Dr. MERRET.
- Dr. WHISTLER.
- Mr. HOSKYNS.

Out of this new Council were elected for officers

The lord viſcount Brouncker,	preſident.
Mr. Hill,	treaſurer.
Dr. Wilkins, Mr. Oldenburg,	ſecretaries.

Of the ten new members of the Council were ſworn by the preſident

Mr. Howard.
Sir Anthony Moroan.
Sir Peter Wyche.
Mr. Colwall.
Dr. Merret.
Dr. Whistler.
Mr. Hoskyns.

Mr. Hill was ſworn treaſurer.

December 2. Mr. Colwall preſented the Society with fifty pounds, making it withal his requeſt, to be permitted to continue his weekly payments, from the obligation of which the ſtatute concerning benefactors diſcharges all ſuch fellows, as ſhall preſent to the Society ſuch a ſum of money. He had their public thanks for this liberality; and it was ordered, that he ſhould be recorded as a benefactor to the Society, with the expreſſion of his deſire not to be exempted from the ordinary payments for the future.

Dr. Wilkins acquainted the Society, that he had received an anſwer from Dr. Christopher Wren, concerning his promiſed weather-cock, together with the ſcheme thereof. The amanuenſis was ordered to draw the ſcheme in great againſt the next meeting, at which it ſhould be conſidered, together with the letter deſcribing it.

Mr. Hooke informed the Society, that he had ſpoke to Mr. Thompson, to make prince Rupert's perſpective-inſtrument, together with his additions.

The operator was put in mind, of rectifying the thermometer's ſtandard againſt the next meeting.

Mr. Boyle deſired, that obſervations might be made, whether ſometimes the weather does not appear more cold by the thermometer than to men. Some of the Society affirmed it to do ſo, and in particular, that in cold dry weather, the thermometer would be more affected than men; but in cold moiſt weather, the contrary. It was moved, that in making the obſervations, care ſhould be had to inquire, whether this difference be found by others, as well as the members of the Society.

Mr. Boyle deſired alſo, that inquiry might be made, whether there be not greater degrees of cold than is neceſſary to glaciation? And whether water turned into ice may not be advanced to a greater degree of cold? As alſo, whether there may not be certain things, that may produce the ſame effects, that cold doth, in ſome bodies, which they will not produce in others, though they may ſeem as ſuſceptible, as the former, of the actions of heat and cold.

Dr. WILKINS moved, that the air might be drawn out of rectified ſpirit of wine, in order to put ſuch exhauſted ſpirit into a thermometer, to obſerve the actions of heat and cold upon it. Dr. GODDARD was deſired to be curator of this experiment, who conceived, that the whole liquor was likely to be exhauſted.

Sir ROBERT MORAY produced prince RUPERT's powder-tryers, to try in them the difference of the force of ſeveral powders: and the experiments being made, it was found, that the common powder, with the fixed ferrel, raiſed the weight very little; whereas the ſame quantity of the prince's powder, with the looſe ferrel, ſtruck it up to the top with ſome return. Again, that the prince's powder, the ferrel being firm, raiſed the weight to three quarters of the whole; the common powder, but to two notches: but without the ferrel, the prince's powder raiſed it to half the hight and more; the common powder as before.

The prince's powder having double the effect in the tryer with a long ferrel, to what it had with a fixed ferrel, it was referred to the preſident, to conſider of the reaſon of it. The ſame kind of powder being found to differ in ſtrength from the common Engliſh powder as about eleven to one, Sir ROBERT MORAY moved, that it might be conſidered, how to make ſuch powder in England, ſince it might be carried in far leſs quantity to perform the ſame effects, that ordinary powder doth; and the charges of making it would not be ſo great, as to take away the advantages of it.

Sir ROBERT MORAY offered his ſervice, in deſiring prince RUPERT to proſecute theſe experiments, by putting looſe ferrels into guns.

Mr. POVEY mentioned, that powder ſent to the Indies loſt its virtue. Mr. HENSHAW offered this for a reaſon of it, that the air there being very moiſt, did by relaxing the ſalt of it ſpoil its ſtrength, though by working it up again its goodneſs was recovered.

The operator was ordered to make ſuch powder-tryers as thoſe of prince RUPERT; as alſo the little inſtrument, by which that prince made ſmall ſcrews with very great diſpatch.

The operator was directed alſo to try the experiment in Mr. HOOKE's new powder-engine by himſelf, and then to do it before the Society at their next meeting.

Mr. POVEY mentioned a ſpring of his, ſinking at Michaelmas, and beginning to riſe again after Chriſtmas, and continuing to riſe till about April, at which time it came to its fulneſs again. He added, that ſprings were obſerved to bubble up at Saliſbury about April.

Mr. **Hoskyns** mentioned a ſpring at Barneſly in Glouceſterſhire, that roſe againſt fair, and ſunk againſt foul weather; as alſo, that the diggers for wells, if they find water any where between Michaelmas and Alhallontide, conclude, that the water never fails in ſuch places.

Mr. **Boyle** moved, that Mr. **Povey**, Mr. **Hoskyns**, and others, who could, might bring in their collections of obſervations concerning ſprings.

Dr. **Wilkins** related, that he had heard Col. **Birch** affirm, that he had an artificial ſpring made on the ſide of a hill, by digging a trench, and throwing ſtore of pebble-ſtones into it, and covering it with earth; which having a quick fall of rain-water, would furniſh the trench with water, not only whilſt the rain-water laſted, but a long time after the rain was paſt.

Mr. **Balle** remarked, that ſprings are often made on the ſides or bottoms of hills, by giving vents for water that is there; whereas the preceding ſtory ſeems to ſpeak of ſprings made by trenches where no ſpring-water is; the like whereof, the lord **Bacon** records in his *Natural Hiſtory*[1].

Dr. **Wilkins** obſerved, that Dr. **Ent** had made conſiderable obſervations about ſprings. He was deſired to ſpeak to Dr. **Ent** to communicate them to the Society.

Sir **Robert Moray** mentioned a coal-pit belonging to the earl of **Kincardin**'s grandfather, within a mile of Calros in Scotland, lying within the high-water-mark, about half a mile from the ſhore, where the ſea flows upright over the place where the mouth of the pit was, 15 or 16 foot. Here was a great round of ſtone of 100 foot diameter or more, raiſed higher than the high-water, and ſo filled and ſtrengthened with clay, that the water could not pierce it, wherein a hole was left in the middle for digging of the pit. The pit went down into a rock many fathoms under the ſea, till they found the vein of coals, which was digged out, for a great many years together yielding very good coal; ſo that there were great vaſt caverns made under the ſea, out of which the coal had been wrought. The water, which the coal afforded, was drawn up by a mill, ſituated upon the brink of the ſhore. This mill was turned by water, conveyed about half a mile from a convenient hight in ſpouts of wood, which, at the pit's mouth where the wheel was turned, was raiſed about 30 foot, and turned a wheel of about 24 foot diameter. The pit, out of which the water was drawn, was 40 fathom deep: it was digged till either it was emptied of coal, or the ſea by ſome accident drowned it, about 20 or 25 before. The place, where the pit was within the ſea-mark, out of which the coal was digged and brought, was made where it was dry at low-water; and ſhips of good burthen laid their ſides to it at high-water, and ſo took in the coals. The water drawn out of the pit upon the ſhore was freſh water, to Sir **Robert**'s beſt remembrance.

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[1] Century i. nº 25. p. 6. 9th edit. London, 1670. fol.

Mr. **Howard**'s account of ſaffron was read; and upon his mentioning ſome additions, which he had ready to join to this paper, was deſired to communicate them likewiſe.

He promiſed to produce before the Society the kiln and other inſtruments employed for the ordering of ſaffron.

Sir **Ellis Leighton** was propoſed candidate by Sir **Robert Moray**.

The experiments appointed for the next meeting were, one in the compreſſing-engine, and another in the new powder-engine.

December 7. The new **Council** met the firſt time, at which were preſent,

The lord viſcount **Brouncker**, preſident.
Lord **Berkley**.
Mr. **Charles Howard**.
Sir **Robert Moray**.
Sir **Paul Neile**.
Sir **Peter Wyche**.
Mr. **Aerskine**.
Mr. **Povey**.
Mr. **Balle**.
Dr. **Wilkins**.
Dr. **Goddard**.
Mr. **Palmer**.
Mr. **Hill**.
Dr. **Merret**.
Dr. **Whistler**.
Mr. **Colwall**.
Mr. **Hoskyns**.
Mr. **Oldenburg**.

The lord **Berkley** and Mr. **Povey** were ſworn members of the **Council**; the other eight new members having been ſworn upon the anniverſary election-day.

Upon debate, whether the eleven continued of the old Council ſhould be new ſworn, the **Council**, after mature conſideration of the words of the charter concerning this point, was ſatisfied, that they were not to be ſworn anew; but the two ſecretaries, elected again for another year, were judged to be obliged by the words of the charter to renew their oath, which they did accordingly.

It was ordered, that the preſident, Sir **Anthony Morgan**, Mr. **Hill**, Mr. **Colwall**, and one of the ſecretaries, or any three or more of them (whereof the preſident and one of the ſecretaries to be two) be a committee for examining the accounts of Mr. **Balle**, the late treaſurer, from Midſummer to St. Andrew's-day.

The motion of providing experiments for his majeſty's reception being renewed, and conſideration being had of the neceſſity to appoint a perſon for the careful preparing thereof, it was voted, that Mr. **Hooke** ſhould be invited to lodge in Greſham-college four days in the week, *viz.* Mondays, Tueſdays, Wedneſdays, and Thurſdays; and that a convenient lodging ſhould be provided for him, and he allowed twenty ſhillings a week for that time. Mr. **Hooke** was called in thereupon, and this propoſition being made to him, he accepted of it.

It was ordered, that Mr. HOOKE attend the COUNCIL every Monday, with an account of the ſucceſs of the experiments to be prepared for his majeſty's entertainment:

That the experiments, to be made on Wedneſdays at the ordinary meetings of the SOCIETY, be conſidered of by the COUNCIL on Mondays, whether they were fit and ready; as alſo, that ſome conſiderable experiments be had in reſerve for extraordinary occaſions: And

That Dr. MERRET, Dr. WHISTLER, and Mr. HOSKYNS, peruſe the books of the Society, wherein the experiments and other philoſophical matters, treated of at their meetings, are recorded; together with their journal-books; and conſider, which relate to and depend upon one another; as alſo, wherein they may be defective, and how farther to be proſecuted.

December 9. At the meeting of the SOCIETY,

Dr. WREN's deſcription of his weather-clock, conſiſting of two wings, that may be added to a pendulum-clock, was read, and ordered to be regiſtered, together with the ſcheme of it [a], as follows:

" Upon the index-wheel of the clock, within the plate, is fixed the little wheel A, which moves the rack B, annexed by the joint C, to the crooked piece H, C, D, E, G, which being made thin and light, paſſeth through the baſis of the clock at D and E, and through ſlits in the pillars of the outward frame F, G; at the end it holds two black-lead pencils, upon the points of which (and not in the ſlits) the crooked piece depends. The pencil H reſts and draws lines on the cylindrical ſubſtance of the tunbril K, which is the weather-wheel, moved by quickſilver after the manner I have formerly ſhewn. The pencil I reſteth on the flat of the wind-wheel L, moved by a vane without. On both ſurfaces are deſcribed circular lines for the hours, according to the motion of the rack, and croſs to them ſtrait lines, ſhewing degrees of weather in the one, and rumbs in the other: amongſt theſe permanent lines the pencils deſcribe irregular lines, compounded of the motions of the rack and wheels, much like the motion of the ſhip deſcribed among the longitudes and latitudes of the chart: and from theſe tracks of the pencils may be collected the changes of wind and weather, that have been in the twelve hours laſt paſt.

" Theſe ſurfaces may be printed papers ſlightly ſtuck on with mouth-glew, uſing bread to efface the old tracks. Or they may be a proper ground of whiting, into which the durable lines are ſtained; the other being to be wiped out with a ſponge. Or they may be box, or ivory, or unburniſhed ſilver; if the lines engraven be ſo filled, that the pencils ſtick not in them to hinder the motion."

Upon ſome debate, it was referred to the COUNCIL, to conſider of the expences, and the moſt convenient way of reducing this engine into practice; as alſo, of additions to be made thereunto, whereof ſome were mentioned by Mr. HOOKE.

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[a] Original Regiſter, vol. ii. p. 321.

Mr. Hooke obſerved, that a common ſealed weather-glaſs might be made applicable to this weather-clock; and he was deſired to give a proof thereof to the ſociety at their next meeting.

Mr. Darcy was permitted to be preſent at this meeting, at the motion and deſire of the lord Berkley.

John Creed, eſq; was alſo permitted to be preſent at the requeſt of Mr. Povey, and was propoſed candidate by the preſident.

Sir Ellis Leighton was elected fellow.

The experiment of weighing little glaſs bubbles in the compreſſing engine was made with ſucceſs; and Mr. Hooke was ordered to bring in writing an account thereof at the next meeting.

The experiment of trying the force of powder by weight in the new powder engine contrived by Mr. Hooke was made twice, but without ſucceſs both times; once by reaſon, that the barrel broke in pieces; the ſecond time, becauſe the cover of the barrel bent. It was referred to Mr. Hooke to think of a way to prevent theſe inconveniencies.

Dr. Merret being put in mind of his freezing experiments, promiſed to give an account of them before Chriſtmas.

Mr. Howard's account of ſaffron was read again, becauſe of the additions made by him ſince the laſt meeting. He alſo produced a ſafforn-kiln, and a cake, to be left with the ſociety. His paper was ordered to be regiſtered *.

Mr. Howard promiſed to bring in an account of tanning and preparing all kinds of leather, after a new way; and upon his deſire of having ſome of the ſociety join with him therein, Mr. Henshaw and Mr. Colwall promiſed to do ſo.

Dr. Croune was put in mind to bring in the hiſtory of hat-making, which he had long ſince undertaken to do; and Mr. Hill, the hiſtory of paper; and Mr. Proby, an account of the ſtatutes of England concerning manufactures, eſpecially cloth-making and tanning, and the frauds committed therein.

Dr. Ent mentioned, that deer-ſkins laid at the bottom of a veſſel, and the ſkins of oxen and other beaſts put upon them, would, after the affuſion of water, ſtrive to get on the top of the others. Dr. Wilkins ſuggeſted hereupon, that he had obſerved deer's hair in a microſcope, and found them to be tubulous throughout, like quills; whereas the hair of other animals was like canes, full of pores, but not hollow; ſo that deer's hair being filled with more air than that of other animals, endeavoured, when put under water, to emerge on the top.

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* Original Regiſter, vol. ii. p. 323. It is printed in the Philoſ. Tranſ. nº 138. p 945. for March, 1678.

Mr. Hooke was deſired to obſerve in his microſcope ſome of the deer's hair, what cavities they have: and Mr. Clayton promiſed to furniſh him with ſome deer's hair brought from the Indies.

Mr. Clayton produced ſome of the Bononian ſtone unprepared, which was recommended by the ſociety to Mr. Boyle to make ſuch experiments with, as he ſhould think fit.

Dr. Ent promiſed to communicate his obſervations of ſprings.

Mr. Boyle mentioning, that the tides of the riſing and falling of water were as well obſerved in mines as in ſprings, Mr. Povey offered to make a farther inquiry into this, and to bring in an account of it, together with what he had undertaken to procure concerning the ſeveral mines and ores, and the working of ores in England.

Dr. Hoare was put in mind of bringing in Col. Noye's account of the mines of Cornwall and Devonſhire; which he promiſed to do very ſhortly, together with ſome obſervations concerning ice-mares, and wheels let down to the bottom of the water in winter, and coming up again frozen, when there is no ice at all at the top of the water.

Mr. Povey and Dr. Hoare were deſired to join in the procuring a good account of theſe mines, and in making their correſpondents ſend up ſome of the earth of the mines, and of the ore, as it is digged up, without diſguiſe.

Mr. Boyle mentioned, that ſalt-waters frozen into ice in very cold countries become freſh and potable.

He ſuggeſted, that whenever there appear any odd phænomena in thermometers, it may be obſerved, whether no bubble of air be ſeen on the top.

The operator was ordered to take care, that the piece of Dr. Ent's *lignum foſſile* be brought to Greſham-College.

Mr. Hoskins was deſired to inform himſelf as particularly as he could concerning this *lignum foſſile*.

Mr. Boyle moved, that good inquiry might be made, whether the underground trees had been any where found with branches.

Dr. Hoare and Mr. Balle promiſed to procure a farther information concerning this particular.

Dr. Whistler was deſired to join with Dr. Goddard in making the experiment of exhauſting air out of rectified ſpirit of wine.

Mr. Hooke was put in mind to conſider farther of the bow for killing whales.

Mr. Hill promiſed to endeavour to procure from Mr. Digges a bow of a locuſt-tree; which bow, he ſaid, would ſtand bent for five or ſix months together, and not loſe its ſpring.

Mr. Povey promiſed to preſent the ſociety with a piece of locuſt-tree.

The experiments appointed for the next meeting were one in the compreſſing engine, and another of exhauſting air out of ſpirit of wine; the former to be made by Mr. Hooke, and the latter by Dr. Goddard and Dr. Whistler.

December 14. At a meeting of the Council were preſent

The lord viſcount Brouncker, preſident.
Mr. Howard.
Sir Paul Neile.
Sir Anthony Morgan.
Sir Peter Wyche.
Mr. Aerskine.
Mr. Balle.
Dr. Goddard.
Dr. Merret.
Mr. Boyle.
Sir Robert Moray.
Dr. Whistler.
Mr. Palmer.
Mr. Hill.
Mr. Colwall.
Mr. Hoskyns.
Mr. Oldenburg.

Mr. Balle promiſed to the ſociety under his hand, as a preſent, the ſum of one hundred pounds, to be paid in before the 1ſt of April following; and he preſented them with an iron-cheſt having three locks and keys.

Sir Anthony Morgan was deſired to peruſe the ſtatutes of the ſociety, and to communicate his remarks upon them to the reſt of the new members of the council, and upon joint conſideration had thereof to make a report to the council.

Sir Anthony accordingly took the ſtatute-book home with him.

It was ordered, that Dr. Wren be deſired to make an eſtimate of the charges of a plain weather-clock, ſuch as he himſelf had deviſed; and to conſider of the eaſieſt contrivance to put it in practice:

That the ſecretary deliver in a liſt of the names of all the benefactors to the ſociety, together with an account of their donations, and the time when they preſented them:

That the ſaid benefactors be regiſtered in looſe vellum ſheets: And

That Mr. Palmer conſult Mr. Ellise, whether the charter of the ſociety ſpeaks fully enough to impower the council to grant licenſe to their printers for printing ſuch books, as ſhall be committed to them by the ſociety concerning their deſign and work.

December 16. At the meeting of the SOCIETY

Sir ELLIS LEIGHTON was admitted.

Mr. CREED was elected and admitted.

Mr. WATERHOUSE gave notice of a letter received by him from Mr. CHILDREY, ſignifying, that the thermometer ſent to him was broken: as alſo, that he would ſhortly communicate his manuſcripts of obſervations of the weather, and firſt of all thoſe of three ſeveral perſons made upon every day of the year 1648.

The operator was hereupon ordered to make a ſtronger thermometer, and to ſend it to Mr. CHILDREY with all poſſible care: and Mr. WATERHOUSE was deſired to give notice to him, that the ſaid manuſcripts, mentioned in his letter, would be very acceptable to the ſociety.

Dr. MERRET preſented a diſcourſe of his concerning the tin-mines and the working of tin in Cornwall; which was read, and ordered to be regiſtered[x]. The doctor promiſed to furniſh the ſociety with the materials of theſe mines.

Mr. WATERHOUSE offered his ſervice in engaging a friend of his in the weſt of England to give a good account of the mines there.

Mr. BOYLE moved, that ſome perſons, who had the opportunity, might be deſired to make a trial with two weather-glaſſes put in a mine, one ſealed, the other unſealed, to ſee what the heat of damps would work upon the one, and the preſſure of air upon the other. Sir ROBERT MORAY, Mr. POVEY, and Dr. MERRET were deſired to recommend this experiment both in Scotland and England.

Dr. MERRET mentioned, that he had kept a thermometer in a cellar for a while, of which he intended ſhortly to bring in an account.

Mr. HOOKE's paper concerning the experiment lately tried before the ſociety of weighing two ſmall glaſs-balls in the compreſſing engine, together with deductions, was read, and ordered to be regiſtered[y].

He was deſired to repeat at the next meeting, with more exactneſs, the experiment made this day of weighing the condenſing engine, after it is crouded full of air, to ſee how it then differs in weight from itſelf when filled after the natural manner.

He propoſed an experiment to be made with the compreſſing engine, of applying a gun to it, to ſee, with what force it will be able to ſhoot a bullet, arrow, &c.

The operator was ordered to prepare a gun for this purpoſe.

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[x] Original Regiſter, vol. ii. p. 329. It is printed in the Philoſ. Tranſ. nº 138. p. 949, for March, 16, 8.

[y] It does not appear in the Regiſter.

The operator was alſo appointed to try again by himſelf the experiment of the new powder engine, and to give an account of the ſucceſs thereof at the next meeting.

Dr. Goddard gave ſome account of the experiment committed to him and Dr. Whistler, of exhauſting the air out of rectified ſpirit of wine; and promiſed to proſecute it, and was deſired to give an account of all in writing.

Mr. Povey promiſed to produce before the ſociety a table of *lignum foſſile*, looking like wood, but being indeed ſtone.

Capt. Taylor was deſired to ſend ſome of the wood of the locuſt-tree out of Virginia, whither he was going.

It was ſuggeſted, that the beſt ſort of locuſt-trees grows in Jamaica.

Mr. Hooke was deſired to examine by his microſcope ſome Indian deer's hair produced by Mr. Clayton, and to make a report, whether they are tubulous or not.

He was likewiſe put in mind to preſs the workman to diſpatch prince Rupert's perſpective engine againſt the next meeting.

Mr. Balle preſented the ſociety with an iron-cheſt having three locks and keys, and promiſed one hundred pounds to be paid for their uſe before the 1ſt day of April following. He received the ſolemn thanks of the ſociety; and it was ordered, that he ſhould be recorded as a benefactor upon the payment of that ſum.

December 21. The Council met, at which were preſent

The lord viſcount Brouncker, preſident.
Mr. Boyle.
Sir Robert Moray.
Sir Paul Neile.
Sir Anthony Morgan.
Mr. Aerskine.
Mr. Balle.
Mr. Palmer.
Dr. Wilkins.
Dr. Goddard.
Dr. Merret.
Dr. Whistler.
Mr. Hill.
Mr. Colwall.
Mr. Hoskins.
Mr. Oldenburg.

It was reſolved, that the council meet on the Wedneſday ſe'nnight following, being the 30th of December, and ſo for the future on Wedneſdays at twelve of the clock, in Greſham-College, till farther order.

It was ordered, that Dr. Goddard and Mr. Palmer be added to the committee for reviewing the ſtatutes; and that this committee fix upon particulars, wherein they deſire alterations.

Mr. Palmer reported, that it was the opinion of Mr. Elliſe, that the ſociety's charter ſpeaks fully enough to authoriſe the council for granting licence to their printers to print ſuch books, as ſhall be committed to them by the ſociety concerning their buſineſs.

It was ordered, that Mr. Martyn and Mr. Allestry be ſummoned by the operator to attend the council on the Wedneſday following, about one of the clock, to receive their commiſſion ſealed: And

That Mr. Evelyn have leave to print the five diſcourſes concerning cider, formerly brought and read at ſeveral meetings of the ſociety, written by Sir Paul Neile, Dr. Smith, Mr. Beal, Mr. Newburgh, and Capt. Taylor; as alſo Dr. Goddard's diſcourſe concerning the texture of trees.

It was reſolved, that no book be printed by order of the council, which hath not been peruſed and conſidered by two of the council, who ſhall report, that ſuch book contains nothing but what is ſuitable to the deſign and work of the ſociety.

It was ordered, that Dr. Goddard and Dr. Merret peruſe Mr. Evelyn's book called *Sylva*, together with *The appendix of fruit-trees*, and the *Calendarium hortenſe*, and make their report to the council, according to the next preceding order: And

It was reſolved, that the form of the *Imprimatur* given by the council of the ſociety to their printer, be as follows:

" By the Council of the *Royal Society of London for improving natural knowledge*, ordered, that ——— book be printed by John Martyn and James Allestry, printers to the ſaid ſociety. *Dat.—die—menſe—anno—*"

Signed by the Preſident.

It was ordered, that Dr. Merret and Dr. Whistler inquire of ſome members of the College of Phyſicians concerning the form of the warrant for bodies to be demanded from the ſheriffs of London for diſſection, and make report thereof at the next meeting of the council.

December 23. At the meeting of the Society,

Dr. Ent's table of *lignum foſſile* ſent him out of Italy was produced; and he was deſired to permit, that ſome ſhavings of it might be diſtilled, to ſee, what this kind of wood would yield: which being granted by him, the operator was ordered to employ a joiner to plain this table for ſome ſhavings.

Mr. Hooke was deſired to look upon a piece of this wood through his microſcope.

Mr. Henshaw was deſired to produce his book, that treats of the *lignum foſſile*, or to give an extract of what is there diſcourſed of; which he promiſed to do.

Mr. Hooke's account of the experiment made at the laſt meeting of weighing the compreſſing engine with condenſed air in it, was read, and ordered to be regiſtered[z], as follows:

"The receiver of the engine being cloſed, as is uſual, and the air in it being "condenſed into about a quarter of the ſpace it at firſt poſſeſſed (which was known "by the gage included within the receiver) the whole engine was put into a pair "of ſcales, and counterpoiſed with a weight of ſeventy-nine pounds and three "quarters.

"Then the ſtop-cock of the receiver being turned, and the included condenſed "air ſuffered to go out, the engine grew lighter by an ounce, there being ſo much "added to the engine-ſide to bring it again to an equilibrium."

The ſame experiment was ordered to be made again more exactly at the next meeting; and the operator was directed to provide a pair of fit ſcales for the weighing of the ſaid engine.

Mr. Hooke produced the new perſpective engine of prince Rupert's invention, together with his own additions, to caſt emboſſed things into perſpective, as well as plat-forms.

It was ordered, that this engine be ſhewed to prince Rupert; but that firſt two rulers of wood be put in the place of the two threads, that direct the paralleliſm.

Dr. Goddard gave ſome farther account of the exhauſting of the air from ſpirit of wine; and what ſtrength the ſpirit loſt, and how much it grew lighter by it; of all which he was again deſired to bring in an account in writing.

Mr. Boyle moved, that a trial might be made to exhauſt the air from bodies not fluid; alledging, that he had made the experiment upon oil of anniſeeds, which being congealed and put into the engine, upon the evacuation of the receiver, ſent bubbles out of its body very conſpicuouſly. He added, that he intended to proſecute this kind of experiment upon ſeveral other bodies, and promiſed an account thereof.

Mr. Hooke produced a microſcopical obſervation of the hair of an Indian deer, which repreſents it to be like a ſpunge, not like quills.

Dr. Ent being called upon for his obſervations of ſprings, promiſed to bring them in after his lecture[a].

Sir Robert Moray mentioned, that he had received from Africa ſome boxes with poiſon, and had left them with the preſident, who was deſired to produce them at the next meeting.

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[z] Original Regiſter, vol. ii. p. 328.

[a] probably at the College of Phyſicians.

Mr. **Boyle** related, that the viper-catchers find in the bag, wherein they keep their vipers, young ones among the old, and the old ones whole and ſound.

Dr. **Croune** affirmed, that he had ſeen ſeveral young eels alive in the belly of an old one, ſome of which were as big as a pin, others as ſlender as a fine thread, others yet unformed like a *mucus*.

Mr. **Boyle** added, that he had met with the like relation in a German author.

Mr. **Henshaw** remarked, that he had ſeen fiſh-ſpawn having both eggs and little live animals moving up and down in the ſhell. Mr. **Hooke** was deſired to make obſervations of fiſh-ſpawns with a microſcope.

Mr. **Boyle** being put in mind of having been formerly deſired to conſider and give an account of **Glauber**'s way of diſcovering minerals, informed the ſociety, that this was only by mixing ſome glaſs with the mineral, and that thereby the metal predominant in the ore is diſcovered.

Dr. **Goddard** being called upon for the experiment formerly committed to him of comparing the weights of metals in air and water, and he not having yet made it, it was deſired, that he and Dr. **Wren** and Mr. **Hooke** ſhould be joint-curators to provide Monſieur **Monconys**'s way of weighing bodies in water. And Dr. **Goddard** mentioning another way of doing this, it was ordered, that both ways ſhould be prepared.

Occaſion being given to diſcourſe of tormenting a perſon with the ſympathy-powder, Dr. **Wren** related, that in the houſe of a kinſman of his, the experiment had been tried by him upon a ſervant, who had grievouſly cut her finger; and a rag rubbed upon the wound being dreſſed with calcined vitriol, and put into the maid's boſom, her finger within a ſhort time was cured. Whereupon he had taken the rag from her, and heated it upon the fire, whilſt the maid was ſweeping the next chamber; who, upon a ſudden, flung away the broom, and cried out for the pain in her finger; which being looked to, was found very fiery: upon which they cooled the rag again, and dreſſed it as formerly, and within a day or two the finger was intirely cured.

Mr. **Boyle** undertook to try this experiment upon a dog.

He being reminded of his promiſe to procure the way uſed by the earl of **Cork**[b] in tranſporting carps into Ireland, ſaid, that he had now a good opportunity to perform his promiſe, the earl being then in London.

It was ordered, that every member of the ſociety, to whom experiments and obſervations had been formerly committed, and who as yet had given no account of them, ſhould have a note of their arrears in writing, to put them in mind thereof: And

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[b] **Richard**, eldeſt brother of Mr. **Boyle**.

That the propagating of cider-fruit be proſecuted ; and that the members, who had opportunity, ſhould recommend that buſineſs to their friends : as alſo, that Mr. Reed ſhould be written to by Mr. Hoskyns and Mr. Oldenburg to furniſh graffs. And Mr. Howard was particularly deſired to advance this work.

December 30. The lord Ashley was admitted.

The ſhavings of Dr. Ent's *lignum foſſile* were committed to Mr. Boyle for diſtillation.

Dr. Merret's account of the experiments of freezing made by himſelf in December and January, 1662, was read, and ordered to be regiſtered[e] ; but he deſired to keep it in his hands for ſome little time. It was as follows :

" Since the buſineſs of freezing is obnoxious to many various contingencies, I
" muſt neceſſarily premiſe theſe following circumſtances ; that theſe experiments
" were made in very hard weather, yet with ſome alternate relaxations, the froſt
" continuing above ſix weeks ; and the place I choſe was ſtone windows, expoſed
" to the north and north-eaſt winds, and ſome upon the ground. The veſſels
" were glaſs canes of ſeveral bores, earthen and pewter ſmall pans and porringers,
" ſpoons of pewter and ſilver, glaſſes of various figures ; as vials cylindrical, round,
" and ſquare ; flaſks, recipients, bolt-heads, and ſome conical ones. Moſt where-
" of, by the diverſity of their figure, their openneſs or cloſeneſs, produce various
" effects in freezing, as the following obſervations will ſhew. The quantity alſo
" of the liquor to be expoſed is to be conſidered ; for what will ſhew a ſmall thin
" plate of ice in a ſmall parcel of ſome liquors, will ſhew none in a greater.

" The method I ſhall follow in delivering my obſervations, ſhall be, 1ſt, To run
" over the various figures or bodies, whether fluid or conſiſtent, ſimple or com-
" pound, *&c.* uſed in this work. 2dly, What figures obſervable in thoſe ices.
" 3dly, Some effects ariſing thence. 4thly, Some properties and qualities.
" 5thly, Some lets or helps both to freezing and thawing. 6thly, Some uſes
" of ice.

" In purſuance of which particulars, I had recourſe to thoſe ingenious queries
" of Mr. Henshaw, regiſtered in your *Cimelia*, and then to Bartholinus's late
" book *De Nive*, and to my own collected notes from various authors, adding
" whatever trials I thought meet. And in all theſe I have barely ſet down matter
" of fact, neither mentioning the authors and their errors, which would have been
" both nauſeous and tedious ; nor ſhall I endeavour to render a reaſon of the vari-
" ous φαινόμενα which cannot be done without a volume) but ſhall leave that pro-
" vince to an honourable perſon of this ſociety, who hath had much experience
" and reflexions on this ſubject. And now to my taſk.

" As to my firſt head of things uſed, I ſhall begin with common water, which
" I expoſed in a triple ſtate in like quantities and in open pans, *viz.* 1ſt, cold ;

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[e] Original Regiſter, vol. ii p. 336.

2dly, boiling hot; 3dly, an equal mixture of both the former. The effect was this, the cold was frozen in one hour; the boiling hot in two hours; and the mixt in an hour and an half: but with this difference, that the cold did freeze firſt at the top and ſides, and had a large thick cruſt, before there was any ſhew of ice in the boiling hot; but the mixt and boiling hot began to freeze firſt at the bottom of the veſſels, and when the top was cold, then it freezed there alſo, leaving between the bottom and top of the veſſel a cavity for the water, which in time was wholly converted into ice. The ſame ſucceeded moſt manifeſtly in theſe waters poured on a ſmooth table, where the cold water was preſently frozen, before the boiling hot water could become cold at the bottom.

" Water exhauſted of air, in Mr. Boyle's engine, was frozen almoſt as ſoon as a like quantity expoſed in an open pan: the ice whereof appeared white, and to conſiſt purely of bubbles. The glaſs uſed was a four-ounce round vial, and a ſmall tube one foot long, half filled with water.

" Fair water, wherein arſenic had been infuſed eight months, congealed much ſooner, than a like quantity of water, into very white ice.

" Solutions of all the ſorts of vitriol freezed ſooner in pans and tubs, than water or any other ſolution of the other ſalts, by much; though that of allum came very little ſhort of it. The ice kept both colour and taſte, upon the leaſt touch of the tongue, in all of them. A ſolution of allum did freeze into an ice whiter than milk, and ſtuck ſo cloſe to the ſides of the pan, that it could hardly be ſeparated from it. This was the firmeſt ice offered to me in all my trials, next to which, in both theſe qualities, were the vitriols, eſpecially the Roman.

" Sandever quickly freezeth; frit ſooner than it, and kelp than them both; all of them into lumps very white, and conſequently not diaphanous.

" Sal armoniac ſhewed ſome variety in point of time; for in the ſame pan, quantity, and place with the other ſalted waters, it would for the moſt part freeze long after the former, though once it did before them.

" Common ſalt, two drachms diſſolved in four ounces of common water (for that proportion I obſerved in all my ſolutions) did in thirty hours ſpace, in the hardeſt ſeaſon, turn to pretty hard and white ice, whereas the former ſolutions became ſo in two or three hours at the moſt.

" A beer-glaſs was filled with ſtinking ſea-water, full of ſalt, which within twenty-ſix hours acquired at the top a plate of ice of the thickneſs of an half crown piece, with few bubbles in it. This taſted ſalt and ſtinking as before, but being diſſolved at the fire (or thawed of itſelf) the ſtinking taſte was gone, but the ſaltiſh continued. The reſidue in the glaſs, within four days the ſeaſon continuing, and plates taken off once in twenty-four hours) was frozen throughout; but that at the bottom of the glaſs ſeemed to have a much briſker taſte than that at the top, neither was it ſo firm and friable as that. I tried another

“ beer-glaſs with the ſame water, which froze moſt part of it; but the ſeaſon con-
“ tinued not ſo conſtantly ſharp ſo long together as in the former experiment, and
“ therefore I could conclude nothing therefrom. But in ſmall broad earthen pans
“ ſet in ice, in thirty-ſix hours the ſame water became ice throughout; and with
“ the addition of a parcel of ice or ſnow, much ſooner.

“ Some water was impregnated with as much bay-ſalt, ſome with as much ſalt-
“ petre, ſome with as much ſal armoniac as the water was capable to receive; and
“ neither of theſe did congeal with a very high degree of cold continued ſix days
“ together.

“ A ſolution of ſalt of tartar converted into ice, in much longer time than com-
“ mon water: I obſerved that it began to freeze in a tube at the top, bottom, and
“ ſides firſt, leaving the liquor in the midſt unfrozen; whereas other ſolutions and
“ liquors congealed uniformly, by deſcending or aſcending, or both at the ſame
“ time, from ſide to ſide through the middle. Of this I made but one trial.

“ Salt petre required twenty-eight hours in a very cold ſeaſon, and in that time
“ became in the open pan a moſt pure white ice, perfectly like ſal prunellæ, which
“ an apothecary miſtook it for. This ice, thrown into the fire (after the aqueous
“ humidity was evaporated) did ſparkle as that ſalt uſeth to do. A ſtrong lixi-
“ vium made hereof, with an addition of copperas or allum, ſingly or mixt, ſet in
“ ſnow and ſalt, or ſalt alone, was frozen in one night.

“ Sal gem alone, of all the ſalts, though ſnow and ice were mixed with it in great
“ proportion, and though the pan was ſet in ſalt and ſnow, could not all that time
“ be brought to congelation: an odd experiment.

“ Phlegm of vitriol begins congelation (or coagulation rather) near as ſoon as
“ fair water. A pretty large tube was fil'ed three quarters full with this oil, and
“ about a quarter thereof was frozen, the reſt remaining at the bottom uncon-
“ gealed. This tube was broken in the preſence and by the command of this ho-
“ nourable ſociety, the coagulated part whereof was taſted by many then preſent,
“ and concluded by all thoſe, that it was a ſtrong vitriolate taſte. This coagulated
“ part was of a paler colour than the other; and both theſe mixed and poured into
“ a vial-glaſs heated it ſo hot, that none there could hold it. This coagulated part
“ kept ſo in the air a week after all my other liquors had been thawed, and would
“ in probability have continued ſo much longer, had not the glaſs been broken.
“ I expoſed another leſſer tube with the ſame oil, which became frozen throughout,
“ and required very much relaxation in the air to return to its former humidity.

“ I had ſet a mark on theſe tubes (as on all the reſt, to obſerve their ſeveral
“ riſings) and the oil of vitriol, when coagulated, ſank more than half an inch be-
“ low it; and being diſſolved at the fire, returned to its firſt ſtation, as you alſo
“ ſaw. And this φαινόμενον is peculiar to this oil alone, all other liquors riſing
“ higher than the mark.

“ I now

" I now come to my ſtronger liquors of beer, ale, and wine.

" I expoſed at the ſame time a flaſk of ſmall-beer and another of ſtrong ale, the former whereof was frozen throughout in thirty-eight hours; but three pints of the ale continued unfrozen after ſix days continuance of very hard weather. And as the air then diſpoſed to thawing, I broke the flaſk, and with the unfrozen liquor made an excellent morning's draught at four in the morning. This ale in colour, ſtrength, and quickneſs, ſeemed to me and the other three taſters, that ſat up with me, much better than when it was firſt put into the flaſk; and by comparing it with ſome other in the houſe of the ſame barrel, we plainly found the ſaid difference. After this I took the icy part of the ale, and thawed it at a fire, which was in all a pint of liquor (though the flagon containing three pints of liquor was filled with that ice) very pale, and of a quick and aliſh taſte, very much reſembling that drink, which the brewers call *Blew John*. This ice was not ſo firm as that of water, but fuller of bubbles. I aſſayed the ſame a ſecond time, but could not, by reaſon of the changeableneſs of the weather, attain ſo great a thickneſs of ice as in the former; and in this alſo I found the ſame changes as before.

" A beer-glaſs of Hull ale, in twenty-four hours, contracted a cruſt of ice as thick as an half crown, and proceeding as in ſea-ſalt-water, the φαινόμενα were the very ſame; all the laminæ taken off appeared of the ſame colour and taſte, and the loweſt ice was the moſt tender. Another glaſs of the ſame ale expoſed, did not freeze throughout (no cruſt being taken off) in five days, when my own ale did in a like glaſs, both being ſet out together. Now the taſte and colour appeared the ſame, or at leaſt had no ſenſible difference, when they had been thawed of themſelves and when firſt expoſed. Hull ale hath a brackiſh taſte.

" Claret very ſtrong, expoſed in a ſpoon, in thirty-five hours hard freezing, became an ice, all of it; it was ſoft, kept its former colour and taſte, ſoon diſcovering to the tongue of one, who knew not whence it was, its nature, quality, and kind.

" Canary at the ſame time in a ſpoon expoſed, in thirty-eight hours, acquires on its ſurface an exceeding thin plate of ice as thin as the fineſt paper, and proceeded no farther in four days time then following.

" Neither claret nor canary would ſhew the leaſt ſign of congelation in tubes, much leſs in bottles.

" Two ounces of the beſt ſpirit of wine, expoſed in an earthen pan, did all evaporate in leſs than twelve hours; but the ſame quantity of brandy left near a ſpoonful of inſipid ice, without any taſte of the ſpirit, which caſt into the fire flamed not at all. I could diſcern no bubbles in this phlegmatic ice, but having interpoſed it betwixt mine eye and a candle, it manifeſted many bubbles by its ſhadows. Quære, whether this may not turn to profit in colder countries, in rectifying ſpirit of wine?

“ Now we come to conſiſtent bodies, and ſhall begin with animals and their parts.

“ Two eyes, the one of an ox, the other of a ſheep, in one night were both totally frozen, the three humours very hard, not ſeparable one from another, neither of them diaphanous, as naturally they are, and the cryſtalline was as white as that of a whiting's boiled; the tunicles, fat, and muſcles were alſo frozen, as appeared by their ſtiffneſs, and putting them into cold water; the ice of the wateriſh and glaſſy humour ſeemed to be made of flakes.

“ A pint of ſheep's blood did freeze at the top, and all the ſides of the diſh wherein it was put, and was nothing elſe but the ſcum of the blood. This ice being ſeparated from the blood, and thawed at the fire, and then again expoſed, congealed into a ſeeming membranous ſubſtance, and was taken for ſuch by ſome that ſaw it, and ſo continued in a warm ſeaſon, and ſo appeared in all reſpects a membrane. This alſo was ſeen and regiſtered in the journals.

“ The blood remaining gave me no ſigns, that froſt had taken it.

“ I diſſected a dog and cat, having lain dead in the open air, and found their entrails, nay the very heart, ſtiff, and ſome little ice in the ventricles of their hearts and their *venæ cavæ*.

“ Milk ſoon freezeth into moſt white flakes of ice, retaining the proper taſte of milk: thoſe flakes are ſoft, and manifeſt not many bubbles.

“ Several eggs were expoſed, and both yolk and white in one night were hard frozen. They require a longer time to freeze than apples do. The beſt way to thaw them both, is to lay them on Newcaſtle coal, or in a deep cellar. Whether eggs once frozen will produce chickens or no, I cannot ſay, but have been told by good houſewives they will. Some affirm, that eggs and apples put into water, the ice will be thawed within them, and the ice appear on the ſhell or ſkin: 'tis true, if you hold either of them near the ſurface of the water, they will ſoon gather a very thick cruſt upon their outſides; but if you then break the one, and cut the other, you ſhall ſee them full of ice, and the egg then poached, will taſte very tough; ſo that this ice ſeems to be gathered from without, and not to come from within. And beſides, if it did ſo, they muſt needs loſe their weight, the contrary whereof will anon appear. But for the more ſurety, I proceeded to this farther experiment: I immerſed in my ciſtern an egg and an apple two foot deep into the water, and there ſuſpended them with ſtrings tied about them, to keep them from ſinking, for the ſpace of twenty-four hours, and then took them out and opened them. I could never obſerve in that time, though I often looked at them, any ice on their outſides, and the one being broken, and the other cut, were found both of them within full of ice.

“ The next order ſhall be vegetables, and of them a few inſtances, eſpecially of thoſe which are of a biting or ſower taſte. Now for the firſt, I imployed the roots of horſe-radiſh and onions (for other edible roots and plants, every one

" knows, will freeze) which ſhewed the froſt had taken them by their taſte, and
" ice was found between each of the ſkins of the onions, retaining the taſte of the
" root. Yet I have obſerved beer, wherein horſe-radiſh and garden ſcurvigraſs
" have been infuſed, will not freeze ſo ſoon as other ſtronger beer without them.

" Oranges and lemons frozen have a tough and hard rind, their icy juices loſe
" much of their genuine taſte; they were both frozen hard in twenty-ſix hours, or
" a little more, having a thick rind. They, as other fruits, when thawed, ſoon be-
" come rotten, and therefore the fruiterers keep them under ground in low cellars,
" and cover them with ſtraw, as they do their apples.

" Which did, expoſed, in one night, freeze throughout: if you cut one of them
" through the middle, it will have, on both the plains, a moſt pure thin ice,
" hardly diſcernible by the eye, but eaſily by the touch, or by ſcraping it off with
" a knife. The cores of theſe apples ſoon turn brown, and begin their corruption
" there.

" Oil expoſed did acquire the conſiſtency of butter melted and cooled again;
" but in caves and cellars I could never ſee it more than candy. Strong white-
" wine vinegar did all ſoon freeze in a tube, and without any apparent bubbles.

" And to conclude, without mentioning nuts, bread, butter, cheeſe, ſoap, and
" many other things, which came under my trial, it is moſt certain, that whatſo-
" ever hath any wateriſh humidity in it, is capable of congelation; what are not,
" you have in the next paragraph.

" Having now done with what will freeze, I ſhall briefly recount ſome things,
" whereon the cold hath no ſuch effect.

" We mentioned before ſpirit of wine; add to it ſuch ſtrong waters, as are made
" of it, *viz. aqua Mariæ*, *cæleſtis*, &c. and Canary wines in large veſſels. 2dly, The
" ſtrong lees of ſoap-boilers, and others made of other ſalts, to which refer the
" ſpirits extracted from ſalt, vitriol, ſalt petre, aquafortis, and ſpirit of ſulphur;
" which laſt precipitated to the bottom of the tube a ſmall quantity of powder
" very like in colour to ſulphur vivum, which being ſeparated from the ſpirit
" (for nothing of that incorporated) cracked between my teeth, and taſted like
" brimſtone; and being put into water, made it as white as lac ſulphuris doth,
" but it would not flame, perhaps becauſe too much of its ſtrong acid ſpirit was
" mixed with it. Spirit of ſoot afforded alſo a precipitation or ſediment (the ſpi-
" rit not congealing) at the bottom of the tube, of a yellowiſh colour, but
" much bitterer than the ſpirit itſelf, and inflammable alſo.

" But here it is to be obſerved, that the ſaid ſpirits, that would not freeze alone,
" yet with a mixture of about twelve parts of water, or leſs of ice or ſnow, did
" freeze throughout; except the ſpirits of ſalt, of nitre and aquafortis, which would
" not freeze with thoſe quantities of water, ice and ſnow. I intended to have tried
" them with a greater quantity of the ſaid ingredients, but the weather failed me.

“ Whether the ſalt-waters freeze in the ſea, I cannot experimentally determine, but ſhall add what was told me by one, that ſaid he had diſſolved ice in the northern ſeas, and found it very ſalt.

“ The next propoſed was the figure of liquors frozen, wherein I ſhall obſerve in general, that moſt of the liquors differed one from another in their figures, and being permitted to freeze and thaw often, they ſtill returned to the ſame figures, moſt whereof were branched. Allum appeared in lumps; ſaltpetre, tartar, milk, ale, wine, and ſal armoniac in plates, and other liquors mentioned to freeze into a very ſoft ice, ſeeming to be made up of ſmall globuli adhering to each other. Fair water, kelp, and the frits reſembled an oaken leaf, the leafy parts being taken away, and the fibres only remaining, the interſtitia being filled up with ſmoother ice. The middle rib (if I may ſo ſay) as in plants was much bigger than the lateral ones: all which ſeemed but different *ſtiriæ*, whoſe points extended toward the outſide of the veſſel containing the water, and made acute angles with the middle rib, toward the leſſer end of the ſaid leaf.

“ Concerning the figures of frozen urine, I ſhall ſay nothing; the accurate deſcription of curious Mr. Hooke having ſo fully and truly performed that part of my taſk.

“ Now as to the former experiment of Quercetan, and affirmed by many other chemiſts, I made experiments in theſe following vegetables, roſemary, rue, ſcurvygraſs, mint, and plantain, wherewith I thus proceeded: I mixed with half a pint of their diſtilled waters, half or three quarters of an ounce of their own ſalts: the roſemary and rue were calcined, and their ſalts extracted with their own waters, and then were added to their ſalts their own diſtilled waters in the above-mentioned proportions. The glaſſes, wherein the rue and plantain were put, being ſealed with Hermes ſeal, and the other glaſſes left open, the effect was, that neither of them ſhewed the leaſt reſemblance of the plants, from which they were extracted; neither figure nor ſhew of roots, ſtalks, branches, nor leaves (but only a lump of ſmall globuli) much leſs of flower or ſeed. Beſides, the kelp frozen hath many fibres, which is made the moſt of it of *alga marina*, whoſe leaf is long and ſmooth without fibres in it. This one thing I cannot pretermit, that the ſcented waters ſeemed upon their thawing to have acquired and advanced much in their ſcents, and eſpecially the roſemary, whoſe ſalt hath no ſmell, and its water but little; yet thawed, they ſmelt as ſtrong almoſt as freſh leaves rubbed and ſmell'd to.

“ A large recipient was filled with water, which being frozen throughout, and the upper cruſt of the ice broken, there appeared in the middle of it a multitude of thin laminæ of ice, ſome more ſome leſs wide, from which proceeded ſtiriæ or teeth pointing inwards, and ſet at pretty equal diſtances; ſo that the laminæ and ſtiriæ reſembled very much ſo many combs placed in no order, ſome lying directly, ſome obliquely, none tranſverſly; having intervals betwixt each of them: betwixt ſome of them I could put my finger without breaking the points of the ſtiriæ. Thoſe combs were placed round about a cavity in the middle of the receiver, ſufficient to receive two of my fingers.

“ In a flaſk filled competently with water, being frozen, there appeared throughout the ice infinite ſilver-coloured bubbles, very like unto tailed hail-ſhot, of ſeveral ſizes, the largeſt about a quarter of an inch long, where thickeſt, of the bigneſs of a great pin's head, others much leſs in all dimenſions. The points of them all looked outwards, and the bigger part inwards towards the centre, where alſo were the largeſt: for they would eaſily admit a little pin into their cavities without the leaſt reſiſtance. The figures of them were pretty regular, firſt a ſmall thread, and then a head as big as a ſhot, and thence gradually ended in a point: ſome of theſe were ſtrait, moſt a little crooked. There was a cavity in the centre of this ice filled with unfrozen water, from which I could find multitudes of cavities of bubbles not fully formed; and in the more ſolid parts of the ice cut, you may diſcern them by a black ſpot where the hole enters into the cavity. All the ſame phænomena appeared in a ſecond trial, but the bubbles were ſhorter and larger, and not ſo deep pointed. The like I alſo obſerved in a conical glaſs ſealed up.

“ The next thing to be treated of is the effects of freezing, *viz.* the expanſion of liquors frozen; and conſequently thereunto, the breaking of bodies, wherein they are incloſed. All the liquors tried did ſenſibly, in glaſs tubes, riſe beyond any mark, before the liquors could ſenſibly be diſcerned to freeze; and after, roſe ſomewhat higher with freezing. The hight of the riſing I ſhall here ſet of a few experiments, inſtead of many made (having troubled your patience too long in the former paragraphs) in ſeveral proceſſes. Vinegar and urine roſe above half an inch, and lees made with ſalts of roſemary, kelp, the frits about a quarter of an inch; ſolutions of allum and copperas ſomewhat leſs; and in general, the ſaline liquors leſs than water, which roſe a full inch; and ſmall beer, in a very narrow tube, four inches: but water, in the ſmall capillary tubes, could not be perceived either to expand itſelf, and certainly not to freeze at all. Oil of vitriol alone (as hath been ſaid) ſinks below the mark; hot water put into a tube firſt ſinketh, till it is cold, and then riſeth before it freezes.

“ Open-mouthed glaſſes, ſuch as beer-glaſſes, *&c.* filled with water up to the brim, when frozen, the ice will manifeſtly riſe above the ſuperficies, and make a ſolid triangle there: but narrow-necked glaſſes more plainly ſhew this riſing. In a flaſk, filled with water four inches below the mouth, the ice roſe above the mouth, and hung two inches without it; and once, in a bolt-head, the ice roſe five inches above the water-mark. And here I ſhall briefly add two things; firſt, that if glaſſes be filled about two thirds full, they ſeldom break; but if more, they will, for the moſt part, break. Secondly, that round-figured or ſpherical glaſſes, for the moſt part, break in an uniform manner. I filled a bolt-head full to the neck, and ſtopped it at the top, which was twelve inches diſtant from the body, with a piece of melted candle; the ice roſe above three inches in the neck, and the glaſs broke in the thinneſt part of the body: from the point of breaking, as from a pole, the cracks ran as ſo many meridians, but

" unequally diſtant each from the other, and conſequently concurred not in an " oppoſite pole on the other ſide; beſides that there was great difference in the " length of theſe cracks, none whereof went round the glaſs. In a flaſk thus " cracked, in many places, the cracks were very irregular in all places; for ſome " of them ran from the centers upward, others downward; ſome ſomewhat pa- " rallel, but moſt obliquely, and few of them were conſiderably ſtrait. Glaſs " bottles, and eſpecially ſtone jugs, keep very little, and the laſt no method in " their breaking; the ſame alſo befals ſquare glaſſes. Woods follow their grain, " and metals no order at all.

" And now I come to ſome remarks; proceeding (as I ſaid) from this expan- " ſion, *viz.* the breaking of the veſſels, or force of freezing; wherein alſo you " may take notice of that quality of cold mentioned by the poet, *penetrabile frigus*, " piercing where light comes not.

" Two oval boxes, the one of box, the other of maple (both firm woods) con- " taining each about two ounces of water, were filled full, and with ſcrews cloſed " very faſt; but theſe boxes were rended from the bottom to the top in one night, " with gaps big enough to receive a barley-corn into them. Theſe woods retch but " little, and therefore break more ſurely, and with larger rents, than ſofter woods " will do.

2. " A pepper-box of lattin, made of iron covered with tin, had the neck " broken off, and holes made in the top near the neck; and the bottom, where " it was ſoldered, was ſo diſſevered, that water would eaſily run out there.

3. " Leaden pipes laid above-ground were broke in many places; one I ſaw " twenty yards long, broken in ſeven places; and another in my cellar ſix yards " long, broken in two places. I ſaw likewiſe in many places of this city leaden " pipes, above a foot deep under-ground, broken in ſeveral parts.

4. " Cocks of ciſterns, and other braſs cocks, and alſo the barrels in pumps, " made of braſs or lead, uſually break with the froſt.

" I expoſed a copper box of a pear-faſhion, which did bear three ſeveral freez- " ings, by reaſon of the great extenſibility of that metal; but at the fourth aſ- " ſay, it cracked all along one ſide of it almoſt to the ſcrew. Next, I tried a " cylindrical ſilver inkhorn, but that did bear five trials, and therein I could per- " ceive neither crack nor dilatation of its ſuperficies: I intended to have tried it " in a ſmall bottle, but the weather failed me. I expoſed alſo a round ſilver ball, " of the bigneſs of a large nut; the ſilver became very ſenſibly extended to a large " ſuperficies, but did not ſuffer any ſolution of its continuity.

" Tobacco-pipes, and all earthen ware, taking any froſt in their drying (before " they are burnt) become very brittle; and being put into a ſtrong fire, will cer- " tainly break into many pieces. Tiles of houſes, and hard ſtones in buildings, " ſcale and break off upon thawing; and thence it is, that the northern ſides of "ſtone buildings firſt decay and moulder away, as it is moſt manifeſt in antient magnificent ſtructures.

" Alabaſter or marble having any chinks in them frequently break with froſt; and the ſtatuaries tell me, they never ſaw any ſolid marble break. As for flints, paving ſtones, precious-ſtones, and ſuch as will receive a poliſh; the bitumens, as amber, kennel-coal, &c. I could never ſee any effect on them.

" The next effect ſhall be of adheſion, concerning which take the following experiments.

" A ſmooth piece of ice was laid on a ſmooth table, and common ſalt thrown upon it: the effect was, that the ice ſtuck ſo firmly to it, that it could not be ſevered from the table without breaking the ice into many ſmall pieces: and it will continue in this cloſe coheſion, till the ſalt hath corroded through the ice to the very table (making many holes in the ice) and hath melted it to the very bottom. But if you lay ſalt firſt upon the table, and ice upon it, then the ice ſticketh not, but thaweth.

" Theſe following ſalts applied (as before common ſalt was) cauſe adheſion to the table, but not ſo firm as it, *viz.* kelp, ſandever, ſal indus, gem, prunellæ, armoniac, and potaſhes, but not allum or vitriol.

" The next experiment of adheſion was this; I held a nail between my lips in the open air a very little ſpace, which ſtuck ſo firmly to them, that I could not pull it thence without difficulty or pain.

" Another effect is concentration of ſpirits and colours: concerning the former, you have already as much as I know, eſpecially in the paragraph of freezing beer and ale: concerning the latter, take theſe following trials; cochineal was boiled in water to a very high tincture, and frozen; and to twice four ounces of this decoction was added, in one glaſs, a little ſpirit of wine, about a little ſpoonful; and in another, as much ſalt-water: all theſe were frozen throughout, and every part of this ice ſeemed to me of an equal colour, though the edges, as thinner and nearer the light, appeared of a brighter colour (as they do unfrozen) but the glaſſes being broken, ſhewed no diſcernible difference in any of them, neither as to colour nor taſte. The like trials were made with madder-weed and indico, and the ſucceſs the ſame.

2. " I expoſed a pint porringer full of the decoction of ſoot, which (the air relaxing) did only freeze an inch thick; this continued above a week conſiſtent (in a thawing-ſeaſon) and very ſolid. Some that ſaw it judged it to be brown ſugar-candy; the taſte whereof was near, if not altogether, as ſtrong as the uncongealed liquor remaining at the bottom. And in another trial, when the whole was frozen, no concentration was ſeen But though it was not my hap to find this effect, my trials having been made in vials, ſquare, cylindrical, or round, yet Mr. HAAK,

" a worthy fellow of this ſociety, happily lighted on it, as you may perceive by " his relation and ſchemes of his glaſſes hereafter inſerted.

" Some affirm, as an effect of freezing, an addition of weight made in the bo- " dies frozen; but this affirmation anſwers not my trials; for in four eggs and four " apples, fully frozen, I found the weight of them the ſame when frozen and " thawed, as they had before they were expoſed, each of the eggs and apples " being weighed in this triple ſtate, both ſeverally and jointly: with the particu- " lar weights I ſhall not trouble you. Beſides, that freezing adds no weight, it " is apparent in ſealed glaſſes, from whence nothing can expire, and by exact " ponderation of them, I could not perceive any the leaſt difference in weight in " the ſaid triple ſtate. This I tried ſeveral times with as much exactneſs as poſ- " ſibly I could, and ſtill found the ſame event.

" I ſhall now conclude the effects of freezing, by ranging them into good and " bad: the good are the long preſerving bodies moſt ſubject to putrefaction, " healthineſs, and confirming the tone of all animals, and thickening the hairs " and furs of ſuch as have them, fattens ſome; beſides, it exceedingly clears the " air, and other bodies, as it is manifeſt by the ſtinking ſea-ſalt-water before- " mentioned, as alſo by this that followeth; namely, I took ſix of the moſt muſty " ſtone bottles I could procure, and competently filled them with water, which, " after freezing and thawing again, became as ſweet as ever they were before.

" Bad effects are, the killing and deſtroying animals and vegetables, by con- " gealing and ſtopping their vital and nouriſhing juices, rendering them totally " immovable. It is obſervable in Greenland and *Nova Zembla*, nothing but graſs " grows; as alſo what was told me by Dr. COLLINS, the preſent phyſician of the " emperor of Ruſſia, that no thorny plant nor thiſtles grow in that country. " And this preſent year, moſt of the roſemary and ſage about London was wholly " deſtroyed, beſides moſt of the more tender plants.

" My fourth propoſal was the properties and qualities of ice, ſome whereof my " taſk engageth me to enumerate only; ſuch are, its ſlipperineſs, ſmoothneſs, " hardneſs; whereby, and by its bulk and motion, it breaks down bridges, *&c.* " its firmneſs and ſtrength, to bear carriages and burthens; its diaphaneity, which " is much leſs than the liquor of which it is made; for I could never diſcern any " object, though but confuſedly, a foot beyond the cleareſt piece of ice, by " reaſon of the many bubbles and luminous parts within it; which bubbles " ſhew only ſhadows; but the ice itſelf, interpoſed betwixt the eye and the candle, " appears in many round circles, from which proceed many rays of light, four, " five, or more, in the form of a ſtar, of about a quarter of an inch in diameter, " which ſo glaze your eyes, you can ſcarcely ſee any thing but bright light and " ſhadows.

" As for its penetration and thickneſs ſomething hath been ſaid above, to which " I ſhall add, that I have ſeen the Thames ice of the thickneſs of eight inches

" and more, near the middle of the river, and on the ſide above a foot; and in garden walks, the earth frozen near three foot deep; whereas on the ſides of the ſame walks, on a richer mould, the froſt did not reach much above two foot and a quarter; and pipes of lead have been broken above two foot under the ſurface of the ground. I ſhall not mention the huge mountains of ice found in the moſt northern ſeas, but proceed to its weight.

" It is generally known, that ice ſwims upon the water; but I have ſeen ſnow-balls moiſtened only with water, and then compreſſed with a ſtrong force, and afterwards frozen, to ſink: beſides, the congealed oil of vitriol deſcends in water, and common ice is frequently obſerved under water. Whether the ſolutions of ſalt frozen will ſink, was by me forgotten to be obſerved; and whether congealed oil will ſink in frozen, as BARTHOLINUS affirms. Some affirm, that ſnow-balls hard preſſed, without addition of water, will ſink; but experience teaches me the contrary.

" As for its tactile qualities, every one knows it is colder than water, which you may increaſe by adding ſalt unto it, or rather ſnow.

" Smell it hath none, but it binds up that quality in all, but moſt ſpirituous bodies, which it alſo in ſome degree refracts in them.

Laſtly, ice yields both reflexion and refraction, whereof I ſhall ſpeak, when I come to its uſes,

" My fifth head was lets and helps in freezing, which I ſhall briefly diſpatch. Thoſe, beſides the north and north-eaſt winds, the abſence of the ſun, and the higheſt parts of houſes or mountains, are the mixture of ſnow and ſalt (than which there is nothing more painfully and unſufferably cold to my feeling) as is apparent by the trick of freezing with ſnow and ſalt by the fire-ſide; as alſo, by the ingenious way of making cups of ice, invented by an incomparable perſon. One affirms, that ſalt petre diſſolved in water, and put into a bolt-head, and long agitated, not only cools the hand exceedingly (which is very true) but alſo converts it to ice; yea, in the very ſummer months; which anſwereth not my tryal, though kept a whole hour in that agitation in the hardeſt ſerſon. This following experiment I alſo add, propoſed to me: I filled a bolt-head, containing a quart of water, and ſet it in an iron pan, ſurrounding it on every ſide with ſnow, which covered alſo part of the neck; and then ſet the kettle over the fire, whilſt the ſnow was thawing; but not the leaſt ſign of freezing appeared in the water put into the bolt-head.

" As for the help of thawing, I ſhall add but this one experiment; I ſet in the ſame cellar three pans full of ice; one in Newcaſtle-coal, a ſecond on ſand, a third on the earthen floor; they thawed in the ſame order they are mentioned; which was thrice repeated, and once, that placed on the coal did thaw, when the other continued their ice.

“ Sealed glaſſes ſeem neither to promote or hinder this act of freezing. The ſame ſucceſs I had with apples and eggs in my cellar.

“ The laſt thing I ſhall ſpeak to is the uſe of ice. You may therewith make a ſyphon, being faſtened and applied as uſually ſyphons are; and this will happen, whether you make it one continued piece of ice, or two contiguous ones; for in both the water will run exceeding faſt, and this ſyphon ſoon emptieth all the water out.

“ A ſecond uſe is for refraction, whereof Mr. HOOKE hath given you already a learned demonſtration. And I having formed ſome ſmooth ice into various figures, like moſt of them mentioned by the dioptric writers, the phænomena were the very ſame as in them, like figured glaſſes: but how DES-CARTES made dioptric glaſſes of it I know not, eſpecially to make uſe of them. And laſtly, you may make a ſpeculum of it, eſpecially if a piece of blacked paper be placed behind it: and if you hold a candle at a convenient diſtance, there will appear very many ſpeculums to your eye, according to the number of the bubbles contained in the ice: but I could not obſerve any heat proceed from ice cut in the true figure for burning-glaſſes, and expoſed in naked ice; but frozen in ſpherical glaſſes, it will heat a little.”

Mr. HAAK's account of his experiments of froſt's ſeparating the parts of coloured water, was read, and ordered to be regiſtered[d], as follows:

“ A ſmall glaſs bottle of the figure in the margin, holding between the fourth and fifth part of a pint, being filled with conduit-water, coloured with ſix or ſeven grains (or worms) of cochineal, the water did freeze ſo hard one night in December, that it burſt the bottle into ſhivers, only the parcels hung on yet by the ice till it thawed; but that, which ſeemed moſt obſervable was, that the lower more conic part of the icy body, about a quarter of an inch thick, was altogether colourleſs, or cryſtal-like; and by the next morning, the coloured parts had contracted themſelves from the whole circumference in ſuch ſort towards the center, that their hue appeared much deeper, and the ſhape and proportion much like the yolk of an egg; all the parts about remaining very bright and cryſtraline, until by the ſucceeding thaw, the coloured parts were obſerved ſooneſt to yield, and to ſoak from within their laſt compaſs, whereby the ſame was left very porous, hollow, and ſpongy, or huſk-like; of ſomewhat a greyiſh, or a bright aſh-colour hue, not diſſolving till a good while after, with the reſt of that ice.

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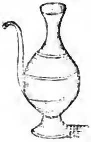
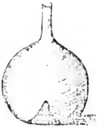
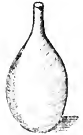
[d] Original Regiſter, vol. ii. p. 333.



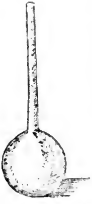
“ The thawed parts being all ſaved and mixed again, were put into another Venice-glaſs-bottle, of the figure in the margin, and ſtood the great froſt in February, which likewiſe burſt the bottle, and had made the coloured parts to concenter, though not ſo much elevated from the bottom as in the former glaſs; neither were the whiter parts altogether ſo clear: there was a ſmall parcel of coloured ice obſerved toward the neck. The colours in this experiment appeared much faint or fading from what they ſhewed before.



“ Some of the like coloured water, a little intermixed with aqua-vitæ, ſtood expoſed to the like froſt all winter, filled up to the neck of one of the ordinary glaſs vials, whereof the bottom is not convex, but turned in with a cone, to make it ſtand. In this there was no diſcernible ſeparation of parts, and the glaſs did not burſt, though frozen all over two or three ſeveral times; and that this glaſs was much thinner and weaker than the former: but neither did that ice freeze in it to that ſolidity, which appeared in them; alſo it diſſolved or thawed ſooner.



“ On the 8th of February, it freezing very hard, another experiment was made, in a more oval glaſs, of fine white metal, and ſtrong, with a new tincture of cochineal in pure conduit-water, and expoſed that night; whereupon, the next morning, the glaſs was found burſt to ſhivers, rather more than the firſt; but the coloured parts were obſerved now equal, and moſt pleaſantly to retire from all the circumference by apparent degrees, almoſt diſcernible to the eye, drawing ſtill into a more narrow and orbicular compaſs, and proceeding in the dye from roſe to ruby, as it were leaving all the reſt about it wholly cryſtalline, until the thaw, within a day and night after, made it likewiſe to look forth in the ſame manner as was obſerved before in the firſt glaſs.



" That ſame night, February 8, another ſtrong but green glaſs-vial, about a foot in length, of the figure in the margent, being alſo filled with ſome cochineal-water, and a few drops of ſpirit of wine, almoſt to the top of the neck; it was alſo burſt the next morning, and the coloured parts appeared diſcernibly enough, as ſevering and ſevered from the reſt, though not ſo clear as in the former experiments, and with ſome difference alſo of parts and poſture. The greater part was alſo in the middle of the bowl, another ſmall parcel toward the neck, another near to the middle, and one more in the very top of it.

" The like coloured water was put in a bowl of ſilver, but without any ſucceſs of ſeparation.

" *Experiment in froſt of water and turpentine-oil together.*

" A glaſs-vial of the ſhape in the margin, filled above half with water, and the reſt almoſt full with turpentine, which had been kept theſe twelve years and upwards, and the water never obſerved to freeze; but this winter, both in December and February, and the laſt time fierceſt, the froſt ſo ſwelling the ice, that it forced the turpentine forth of the glaſs at the top, by the ſides of the cork ſtopple, though without breaking the glaſs; it was pretty to obſerve, as the thaw increaſed or abated, how the oil ſubſided and riſe, and ſubſided again by degrees, until the ice being fully diſſolved, made room again for the turpentine, that was forced out, and ſaved juſt to the mark of its former pitch.

" *Experiment of froſt in ſnow-water.*

" In the body of a fair and ſtrong white glaſs a lembick, there was about a quart of ſnow-water, which likewiſe froze and burſt the glaſs; the body of that ice appeared not ſo ſolidly and cryſtalline and uniformly frozen, as that in the above-mentioned ovals, but had the reſemblace of rays, or bright briſtles or furzes ſhooting forth all along the glaſs from the midſt within, moſt of them horizontally, except towards the roundiſh bottom."

It being moved, that it might be conſidered to make a ſtandard of cold, it was ſuggeſted by Mr. ROOKE, that this might be conveniently done by obſerving the degree of cold, which freezes diſtilled water, and by marking thereupon the expanſion of the liquor in the weather-glaſs.

Dr. WILKINS mentioned, that he had raiſed a heat by a globe of fire, and felt the heat of it through gloves, and lighted a pipe of tobacco with it.

Mr. HOOKE produced a little engine for making the deſcent of quickſilver in glaſs-canes more diſcernible. He was ordered to prepare againſt the next meeting a tube of mercury, and to fit this inſtrument to it.

Some experiments were again made in prince RUPERT's powder-tryer, the ſucceſs of which was, that with common powder, the ferrel being fixed, the body was raiſed but a very little; but with the like quantity of the ſame kind of powder, the ferrel being looſe, the body was raiſed to the top. Both which experiments were tried twice with very near the ſame effect.

Mr. BOYLE produced the head of an alembic with a ſubſtance ſticking to the inſide of the glaſs in the form of a wood, produced from a mixture of oil of turpentine and ſea-ſalt ſublimed with a gentle heat.

Dr. GODDARD deſired more time to proſecute the experiment of exhauſting the air out of rectified ſpirit of wine.

Sir ROBERT MORAY produced three boxes with poiſon brought from Africa; which were ordered to be left with Dr. GODDARD, till the preſenter ſhould ſignify what they were.

The difference of eels being diſcourſed of, and Mr. HENSHAW mentioning the experience, which the keeper of the eel-boat upon the Thames had of this ſort of fiſh, he was deſired to make what inquiry he could of that perſon concerning their difference, food, *&c.*

Sir PAUL NEILE remarked, that the name of the hard eel was *ſhaftling*.

The lord ASHLEY obſerved, that he had found eels living in muddy water to taſte rank, and being put into ſpring water to acquire a ſweet taſte, but with ſome decay of their fleſh.

The operator was ordered to provide ſome eels, and to put them into ſeveral waters, as river water, conduit water, *&c.* to ſee, in which of them they will thrive beſt.

He was likewiſe ordered to keep ſome fiſh in glaſſes with water, to obſerve how they grow there, it being alledged by Dr. WILKINS, that RONDELETIUS kept a fiſh in a glaſs with water at his houſe, which grew ſo big there, that it not only could not get out at the neck, where it was put in, but alſo wanted room to move in the glaſs.

The experiment of weighing the air in the compreſſing engine was again made, and agreed very near with the former; the difference only being of half a drachm, wherein the weight of the engine this day exceeded that of the other; there being now alſo ſome greater condenſation of the engine than before.

The operator was ordered to meaſure how much the globe of the engine contained; and alſo to weigh exactly the engine before he compreſſed the air in it, and to have the counterpoiſe ready for the ſociety; it being apprehended, that ſome of the oil in the veſſel might ſpend itſelf at the emiſſion of the air, and ſomewhat contribute to the diminution of the engine's weight after the air had been let out.

The buſineſs of propagating cider-fruit being again ſpoken of, the lord Ashley commended the red-ſtreak, and eſpecially the red red-ſtreak, for yielding a very rich liquor of a long duration, and for being a conſtant bearer.

Mr. Boyle moved, that ſome of the red-ſtreak cider might be diſtilled, and the ſpirit of it compared with that of wine. The lord Ashley offered a bottle for the trial.

The ſecretary was ordered to write to Sir John Finch concerning the account, which he promiſed to ſend of poiſons.

166¾. *January* 6. At the meeting of the Council were preſent

Dr. Wilkins, vice-preſident.
Sir Paul Neile.
Sir Peter Wyche.
Mr. Aerskine.
Mr. Balle.
Dr. Goddard.
Dr. Merret.
Dr. Whistler.
Mr. Hill.
Mr. Hoskyns.
Mr. Oldenburg.

It was reſolved,

That the fee of the ſecretaries for affixing the common ſeal of the ſociety be an angel: And

That the fee of the amanuenſis for every writing in parchment, to which the common ſeal of the ſociety is affixed, be five ſhillings at leaſt, and more, according as the writing may be larger, at the appointment of the council.

Dr. Merret and Mr. Hoskyns made ſome report of the books of the ſociety; but a fuller report thereof was referred to the next meeting of the council.

It was reſolved, that the commiſſion for the printers be ſealed at the next meeting, for which they were to be ſummoned by the operator then to attend the council.

Dr. Whistler produced the form of the warrant uſed by the College of Phyſicians: and it was ordered, that Sir Anthony Morgan be deſired to fit that warrant for the uſe of the ſociety.

Dr. Merret was deſired to proſecute his collection of the curious things of nature to be found in England, and to preſent the ſociety therewith.

Mr. Hooke was deſired to take care, that the inſtrument for the meaſure of time, conſiſting of only one wheel with hollow camera's in it, moving either with ſand or water for a good ſpace of time, be made.

At the meeting of the Society on the ſame day,

Sir John Talbot was admitted: And

Charles lord viſcount Dungarvan was preſented by Mr. Boyle, and elected.

The experiment of ſhooting with a wind-gun applied to the compreſſing engine was made, the ſucceſs of which was, that the condenſation being made near half in the globe, the bullet, ſhot at the diſtance of about twenty yards, made a very conſiderable dent in a door, ſufficient to have killed a man. It was ordered, that this experiment ſhould be repeated at the next meeting, and a particular account of it brought in writing by Mr. Hooke.

Dr. Merret having found by experiment, that water frozen, though exhauſted, hath ſtore of blebs, and more than unexhauſted, Mr. Hooke mentioned, that he knew a way of reducing water into ice without blebs. Whereupon he was deſired the next froſty weather to try this experiment, and produce the effects of it before the ſociety; as alſo to try, whether ſuch ice, ſhaped into a lens, would ſerve for a burning-glaſs.

Mr. Hooke's application of his little engine to a tube with mercury for the rendering of the aſcent and deſcent of quickſilver more diſcernible, was referred to the next meeting.

He was deſired to prepare, when the weather ſhould ſerve, that ſtandard for cold, which he propoſed at the preceding meeting: And

To weigh a great receiver, both filled with air, and exhauſted: and to do this both ways, by weighing it unexhauſted firſt, and then by exhauſting it firſt, and filling it with air again: As alſo,

To try, whether he could raiſe a thin and exhauſted glaſs-bubble from the bottom of the receiver of the condenſing engine towards the top, by condenſing the ambient air of the bubbles.

Mr Boyle's repreſentation of a wood in a glaſs-head from a mixture of oil of turpentine and ſea ſalt being again mentioned, Sir Robert Moray related an experiment of Dr. Davisson's to be found in his *Pyrotechny*[e], whereby he exhibited in a bolt-head the figures of many trees like fir, with various colours, grey and green, particularly from ſome turpentine put into the ſaid veſſel, and left for ſome weeks to digeſt.

Dr. Thomas Coxe mentioned, that a perſon of quality keeping in a glaſs ſome water drawn out of a well, in which a certain herb grew, perſuaded himſelf, that he ſaw the figure of the like herb in the ſaid glaſs.

Mr. Boyle moved, that it might be tried, whether thoſe figures, that are ſeen upon frozen windows in rooms, that have been warm, and are grown cool again, may not be reduced to a ſalt; and what kind of ſalt it may be, that hath this ſhaping nature.

Mention being again made of the propagation of cider, Mr. Boyle moved, that it might be tried to make cider by infuſion, by cutting good cider-apples into thin ſlices, and keeping them infuſed in water, repeating infuſions of new apples to make it as ſtrong as ſhould be thought proper, and as the water is capable of receiving the virtue of ſuch apples. Some of the members doubting, whether good cider could be made where common water is the baſis, it was ſuggeſted by Dr. Goddard, that this experiment might be made by infuſing ſliced apples in the firſt juice of apples expreſſed for the making a kind of double cider: as alſo, that ordinary cider might be put upon malt. Sir Robert Moray moved, that ale or wort might be put upon apples.

Sir Paul Neile mentioned, that beſt cider might be recovered by putting it into ale at the working thereof, after the proportion of ſix gallons of ſuch ſpoilt cider to twelve of ale.

It being deſired, that experiments of this kind might be made, and Mr. Beal appointed curator thereof; it was ordered, that the ſecretary ſhould write to him, and recommend this buſineſs to his care.

Mr. Boyle gave an account of the way uſed by the earl of Corke to tranſport carps into Ireland; and he was deſired to give it in writing.

He made mention of a little treatiſe of Monſieur Pascal lately publiſhed in French, concerning the equilibrium of liquors and the weight of the air, and that ſome experiments were contained in it, not unworthy of trial. He was deſired to have them extracted, and to preſent them to the ſociety, to conſider thereof, and to recommend them.

Sir Robert Moray related, that he had ſeen at Chatham a new kind of ropes made of a Weſt-India graſs, ſtronger than ropes of hemp; experiment having been made in his preſence, that a certain ſmall hempen rope bore but 400 weight, and broke with a ſuperadded half hundred; whereas a rope made of the ſaid graſs of the ſame length, breadth, and weight with the hempen rope bore 600 weight, and broke with another half hundred.

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[e] Wilh. Davissoni *Philoſophia pyrotechnia ſive Faſciculus Chymiatricus*, Paris, 1635, in 8vo.

It was thought fit, that it might be inquired into, what kind of twiſting was uſed in making theſe graſs ropes; as alſo, whether they would bear ſalt-water, as well as thoſe of hemp; and likewiſe, whether this graſs might not be improved for making of ſails.

Sir Robert Moray related, that at Chatham, in a certain room with ſhutters, which had not been removed for ſome time, upon their being ſhoved up, there fell down between the ſhutters and the wall a great number of flies, all alive, making four ſhovels full.

Mr Boyle remarked, that ſwallows frozen up in ice, upon the thawing away of the ice, had been found alive, and flying about; and that a miniſter had ſent a certificate of this to the king from Dantzic.

Sir Robert Moray related, that the duke of York had ſpoken of it as his own obſervation, that a gun diſcharged at the time, when the wind is at eaſt, gives a thumping noiſe, not at all ſharp; it being uſual for obſervers to conclude it to be ſuch a wind upon the hearing of a gun ſhot off with ſuch a ſound. Sir Robert added, that his highneſs had delivered it as a common obſervation of the ſeamen, that the nights are lightſomer, when the wind is at ſouth-eaſt. He mentioned farther, that he had been informed alſo by his highneſs, that there were certain little ſprings at Croyden, which would run together, and make a ſtream for a certain ſpace, and then ſlide under the ground, and afterwards break out again. Dr. Wilkins having acquaintance at Croyden, was deſired to make a particular inquiry after this fact.

Dr. Ent moved, that it might be tried, whether a burning-glaſs will burn in the morning, as well as at noon and towards ſun-ſet; he conceiving, that this burning depended in ſome meaſure upon the ſtate of the air, and that coldneſs might be ſome hindrance to it. The experiment was refered to the ſummer ſeaſon, when curators ſhould be appointed for it.

Mr. Hooke was deſired to take care, that the wheel with hollow camera's in it, moving with either water or ſand for a good while, be made.

January 13. At a meeting of the Council were preſent

The lord viſcount Brouncker, preſident.
The lord Berkley.
Mr. Howard.
Sir Robert Moray.
Sir Paul Neile.
Sir Anthony Morgan.
Sir Peter Wyche.
Mr. Aerskine.
Mr. Balle.
Dr. Wilkins.
Dr. Goddard.
Dr. Whistler.
Mr. Hill.
Mr. Hoskyns.
Mr. Colwall.
Mr. Oldenburg.

It was ordered, that Dr. Merret and Mr. Hill do acquaint the ſecondaries of London with the power, which the Royal Society hath, of demanding bodies for diſſection; and ſhew the ſaid ſecondaries that part of the ſociety's charter containing that power:

That the operator attend Sir Anthony Morgan for the warrant of demanding a body for diſſection, and carry it to the preſident to be ſigned and ſealed: And

That Dr. Croune and Mr. Colwall have a copy, to be taken by the amanuenſis, of the experiments and obſervations to be made in Teneriffe, as they are regiſtered in the ſociety's Regiſter-book, in order to conſult with Dr. Pugh concerning the moſt convenient way of making them.

The report concerning the ſtatutes was referred to the next meeting.

The preſident acquainting the council, that Mr. Hooke had diſcovered to himſelf, Sir Robert Moray, and Dr. Wilkins, an invention, which might prove very beneficial to England, and to the world, and that he had a good opinion thereof; but that it was neceſſary, that ſome experiments ſhould be made for farther certainty, before it was made public, which would require ſome charges not ſo fit to be put upon the inventor; it was ordered, that the Preſident, Sir Robert Moray, and Dr. Wilkins have power to employ any ſum under ten pounds of the ſociety's money for the ſaid purpoſe.

Mr. Jonas Moore acquainted the council with Sir John Lawson's deſire, that they would appoint a committee to examine Mr. Greatrix's diving inſtrument, or to direct a good method of ſtaying under water for a conſiderable time, to lay the foundation of the mole at Tangier, at the depth of four or five fathoms. Mr. Greatrix being at the door was called in, and this matter being propoſed to him, he ſubmitted to ſuch an examination, provided, that Sir John Lawson would be at the charge of having a new inſtrument made, and promiſe him ſuch a recompence, as they ſhould agree upon, in caſe it be certified by the committee, that it would perform the deſired effect. It was thought fitteſt, that Mr. Greatrix ſhould provide a man, to perform what was expected from his engine.

The preſident and Sir Robert Moray were deſired to view the old inſtrument of Greatrix.

The commiſſion for the printers was ſealed and delivered this day, but left by them with Dr. Goddard to be better ſealed at the next meeting, than could be done at this time by reaſon of haſte.

At the meeting of the Society on the ſame day,

The lord viſcount Dungarvan was admitted.

The operator was ordered to prepare a weather-glaſs with oil of anniſeeds and diſtilled waters.

Mr. Hooke was ordered to have his tube for rendering the aſcent and deſcent of mercury more diſcernible filled with mercury againſt the next meeting, and to bring it up in the meeting-room.

He was directed likewiſe to give an account in writing of the experiment made this day of weighing a great receiver exhauſted of air, and filled with air:

To prepare the experiment of raiſing a thin and exhauſted glaſs-bubble from the bottom of the receiver of the compreſſing engine to the top, by condenſing the circumambient air: And

To repeat the experiment of ſhooting with a gun applied to the condenſing engine, which failed this day.

Notice being given by Mr. Beal in a letter to the ſecretary, that the water at Stampford in Dorſetſhire aſſiſts the brewer to a third part, ſo that two buſhels brewed in this water make full as ſtrong beer, as three buſhels in any other water in Dorſetſhire and Somerſetſhire; occaſion was hence taken to diſcourſe of the fitneſs and advantage of ſome waters above others in brewing. Mr. Matthew Wren related, that the waters of Charwell, by the obſervation of brewers, would make with a fifth part of malt leſs as good beer as the water of Iſis. Dr. Charleton mentioned, that the brewers in Old-ſtreet prefer the water of St. Agnes le Clair for ale. He commended the water of Sambach near Brereton for the ſame purpoſe. Dr. Clarke remarked, that the brewers did not eſteem the water of the Thames on Southwark ſide ſo good for brewing as on the city ſide; ſome of the ſociety attributing the cauſe of this to the goodneſs, with which the water may be impregnated by paſſing through ſome earths; others to the diſſolving power, which ſome waters may have acquired by paſſing through mineral earths, whereby they are enabled to draw a ſtronger tincture It was ordered, that the operator ſhould collect the ſeveral waters in and about London; and Mr. Boyle, Dr. Goddard, and Mr. Henshaw were deſired to examine them ſeveral ways, as by diſtillation, precipitation, *&c.* Mr. Henshaw moved, that ſome oil of tartar might be uſed for precipitation, in order to diſcover what may be mixed with thoſe waters. Dr. Charleton objected, that this way was not ſatisfactory, ſince mineral waters retained much, and precipitated little. Mr. Boyle added, that this way of precipitating would not reach in many caſes, though in ſome it might.

Dr. Charleton gave in a paper propoſing certain experiments conceived by him not unworthy of exact trial concerning freezing and ſnow, ſome of which were recommended to be made; as that of boiling fleſh in ſnow-water, to ſee, whether it would look whiter, and eat more tender: that of diſtilling ſpirit of wine without fire, only by covering the body of the alembic with ice and ſnow, to Monſieur Le Febure.

The manner of tranſporting fiſh from one place to another being ſpoken of, it was obſerved by Dr. Charleton and Mr. Hoskyns, that in doing ſo, the fiſh muſt be continually kept ſtirring.

The experiment of freezing ſwallows by lapping them up in paper, and by putting ſnow and ſalt about them, was ordered to be recommended by the ſecretary to Mr. BEAL: as alſo that of putting a dead and living ſwallow into two ſeveral glaſſes with no larger necks than they will go in by, and being well ſtopt to expoſe them to the froſt, to ſee, what figures will be made by their ſeveral tranſpirations upon the inſides of the glaſſes in froſty weather.

Mr. WATERHOUSE produced a letter from Mr. CHILDREY, dated at Sarum, January 2, *166¾*, accompanying ſome obſervations of the weather for the year *1648*; which were ordered to be filed up[f].

Mr. WATERHOUSE produced likewiſe a ſteatoma cut out of a young woman's breaſt, together with the deſcription thereof, which was ordered to be read at the next meeting.

January 20. At a meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER,
preſident.
Sir ROBERT MORAY.
Sir PAUL NEILE.
Sir PETER WYCHE.
Mr. AERSKINE.
Mr. BALLE.
Mr. PALMER.
Dr. WILKINS.
Dr. GODDARD.
Dr. MERRET.
Dr. WHISTLER.
Mr. HILL.
Mr. COLWALL.
Mr. HOSKYNS.
Mr. OLDENBURG.

The general and particular warrant to demand bodies for diſſection, drawn up by Sir ANTHONY MORGAN, were read and approved.

It was ordered, that the general warrant be ſealed by the preſident, and the other ſigned by him; and that a copy of both be entered into the journal of the council, as follows:

The general warrant.

"By virtue of letters patents under the great ſeal of England, the preſident, " council, and fellows of the Royal Society of London for improving natural " knowledge, do hereby will and require all perſons concerned, that from time to " time dead bodies of the perſons, who ſhall ſuffer death by the hand of the hang- " man, be delivered and taken by ſuch perſon or perſons, as ſhall by the ſaid pre- " ſident, or his deputy for the time being, by any writing under his or either of " their hands, from time to time be nominated and appointed to aſk and receive " the ſame for the uſe of the ſaid Royal Society, in ſuch and as ample manner and " form, to all intents and purpoſes, as the like dead bodies have at any time here- " tofore been, or at any time hereafter may or ought to be, lawfully delivered or " taken for the uſe and by the direction of the preſident of the College of Phyſi-

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[f] Supplement to the Letter-books, vol. ii. p. 215.

" cians and company of chirurgeons of the city of London, by what name ſoever " the ſaid two corporations, or either of them, are known. In witneſs whereof the " ſaid preſident, council, and fellows of the Royal Society aforeſaid have cauſed " their common ſeal to be affixed to theſe preſents this 20th day of January, 1663."

The form of the particular warrant.

" Theſe are to will and require you, that one body, either man or woman, exe- " cuted at Tyburn, this preſent —— being the —— day of —— ſuch as the " bearer hereof R. S. ſhall chooſe, be delivered unto the ſaid —— at the time " and place of the ſaid execution, for the uſe of the Royal Society, he paying the " ordinary fees for the ſame. Given under my hand the day and year above- " written.

" To all, whom this may concern." Signed by the Preſident.

It was ordered, that the treaſurer, Mr. Hill, pay the operator's bill from November 23, 1663, to January 20, 166¾: And

That the operator for the future bring in his bills weekly.

Dr. Wilkins was deſired to ſpeak with the operator as from himſelf, concerning his yearly ſalary, to try whether fifty pounds a year would content him, including the ten pounds allowed him for his conſtant attendance.

Dr. Merret reported, that he had ſpoken with the ſecondaries of London, and given them an extract of the ſociety's charter concerning the power given them therein for demanding of bodies to diſſect; and that they would take notice of it publicly.

Dr. Charleton produced a box of anatomical inſtruments, for which the treaſurer was ordered to pay him five pounds ſeven ſhillings and ſix-pence.

Dr. Whistler moved, that all the peculiar chirurgical inſtruments might be added to the anatomical, in order to make chirurgical operations, beſides diſſection.

At the meeting of the Society on the ſame day,

The preſident acquainted them, that, according to their charter, a warrant was iſſued for demanding a body for diſſection, which was to be performed the next day after the execution in Greſham-College by Dr. Charleton, who had offered himſelf to open the muſcles after a new method.

Sir Robert Moray preſented the ſociety with a *Frutex marinus reticulatus*, which was ordered to be put up in the repoſitory.

He produced a piece of wood petrified in a lough belonging to the lord viſcount Massareene in Ireland; which was likewiſe ordered to be placed in the repoſitory.

Mr. Boyle gave an account of the diſtillation of the ſhavings of the *lignum foſſile*; and that it had afforded nothing but what was found in ordinary wood.

He preſented the ſociety with a linnet and a little ſnake, preſerved already four months, entrails and all, without any change of the colour, in ſome ſpirit of wine made after a peculiar manner. Both the glaſſes, wherein they were kept, were ordered to be ſealed up with wax, and put into the repoſitory.

Dr. Clarke mentioned, that there was an intention of preſerving the whole body of a man with ſpirit of wine in a veſſel well glaſed; ſuggeſting the uſefulneſs of this method of preſerving, that by this means there might be had in readineſs for occaſions an eye, hand, muſcles, larynx, *&c.*

Dr. Merret affirmed, that he had preſerved the very entrails of a cat for twelve years paſt, though they were ſomewhat ſhrunk.

Mr. Boyle obſerved, that he had a liquor compounded of ſpirit of wine and a little oil of turpentine, whereby not only the bodies of animals or the parts thereof might be preſerved, but alſo it might be known what it is that comes away; which being ſuch, that it will not mingle with the oil, falls to the bottom, and is found there.

He offered to preſerve a hand and a larynx.

The paper preſented at the laſt meeting by Mr. Waterhouse was read, containing the deſcription of a ſteatoma cut out of the breaſt of a maid of ſeventeen years of age, cauſed by a bruiſe, when ſhe was but ſeven years old [g].

Sir Kenelme Digby read an extract of a Latin letter ſent to him from Paris, dated January 19, 166⅔ [h], wherein Dr. Borrichius [i], a Dane, acquainted him, that one Monſieur Servier at Lyons had a certain portative engine, whereby the ſeveral tempers and inclinations of men might by the ſole touch of the concerned perſon be known. Some of the members mentioning, that the like artifice was deſcribed by Schottus, Dr. Merret was deſired to conſult that author, and to ſee, whether he agreed with this relation ſent from Paris.

The ſecretary acquainting the ſociety, that Mr. Beal having upon his ſollicitation inquired among the country-people, whether frozen eggs proved fecund, had ſent him for an anſwer, that a whole company, men and women together, had confidently affirmed to him, that they proved ſo.

It being added, that by Mr. Beal's account, all the eggs of the game of an exact cock maſter had been frozen the year before, and ſo frozen, that four of them broke, yet all the reſt proved pregnant; and that, notwithſtanding his objection, that they would have all burſt, if they had been all frozen, the country-people poſitively affirmed, that they had been all frozen; Dr. Ent and Dr. Merret ſuggeſted, that ſtale eggs having ſome vacuity, and conſequently room for extenſion, would freeze without burſting, though new-laid eggs being full would, when frozen, break: whereupon Dr. Gooaro affirmed, that new-laid and even unlaid eggs had ſome cavity obſerved many times by himſelf.

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[g] Supplement to the Letter-books, vol. i. p. 119.

[h] Letter-book, vol. i. p. 125.

[i] Olaus Borrichius, M. D. and profeſſor at Copenhagen. He was born the 7th of April, 1626, and died October 3, 1690. He was a man of great learning, as appears from his writings

Occaſion being given to diſcourſe of the diverſity of taſtes of meat, according to the variety of the food of animals, Dr. Ent moved, that it might be tried, whether a hen would eat muſty, if ſhe eat muſty corn, as the milk of a cow will anſwer in taſte to what the cow feeds on.

Dr. Goddard was deſired to bring in an account of the ſeveral ways of diſtinguiſhing eggs.

Dr. Wilkins being put in mind of the inquiry, which he was formerly deſired to make of the ſprings of Croyden, Dr. Merret mentioned, that they would riſe once in two years after wet weather.

Edward Smith, eſq; was propoſed a candidate by Dr. Merret; and Sir John Lowther by Dr. Whistler.

January 27. The Council met, at which were preſent

The lord viſcount Brouncker,
 preſident.
The lord Berkley.
Mr. Charles Howard.
Sir Robert Moray.
Mr. Aerskine.
Mr. Balle.
Dr. Wilkins.
Dr. Goooaro.
Dr. Merret.
Mr. Hill.
Mr. Colwall.
Mr. Hoskyns.
Mr. Oldenburg.

It was ordered, that the operator be paid twenty ſhillings for his work for the ſociety, and bring in his bills weekly for the materials uſed by him:

That the preſident move this day the ſociety to appoint a committee of phyſicians, who are fellows of the ſociety, conſtantly to conſider, what is neceſſary to be proſecuted in anatomy and chirurgery:

That Dr. Merret bring in a liſt of the inſtruments neceſſary for chirurgery to be added to thoſe of anatomy in the box lately provided for the ſociety: And

That the porter be allowed three pounds a year for his conſtant attendance, to be paid him quarterly.

At the meeting of the Society the ſame day,

Mr. Roger Williams was propoſed candidate by Sir Robert Moray, at the deſire of Sir Paul Neile.

Sir **John Lowther** was elected and admitted.

Mr. **Edward Smith** was elected.

Dr. **Pell** gave notice to the ſociety by Mr. **Haak**, that whereas ſeveral aſtronomers made no mention of the ſun's eclipſe of January 18, 166$\frac{4}{5}$, and the almanack makers paſſed it over as not viſible in England, he had ſeen it at Fobbing in Eſſex[k], which he accounted to have 51° 37′ northern latitude, under a meridian not full 3 min. of an hour more eaſtward than that of London. Mr. **Haak** was deſired to requeſt Dr. **Pell** to impart to the ſociety the particulars of his obſervations concerning this eclipſe.

Dr. **Charleton** was ſolemnly thanked for his pains in the late diſſection of the muſcle; and it was ordered, that all the phyſicians, who were fellows of the ſociety, ſhall be a committee henceforth to order and manage diſſections for the ſociety upon every execution-day, and therein to divide the work among themſelves, and to give notice what parts they intend chiefly to diſſect and to treat of. And Dr. **Goddard** was particularly appointed to take good care of the performance of this.

Col. **Tuke** brought in from Dr. **Thomas Brown's**[l] three papers ſent out of Iceland concerning the quality and productions of that country, the eruptions of mount Hecla, and other vulcano's there, and other obſervables. The amanuenſis was ordered to take a copy of the ſeveral matters contained in theſe papers[m].

Col. **Tuke** mentioned, that hogs would feed on the ſea ſide upon ſea-fiſhes; but that becauſe ſuch food makes their fleſh rank, they muſt, before they are killed, be ſcoured with ſome corn.

Mr. **Hooke** was ordered to repeat the experiment of making a little glaſs-bubble ſwim in the air, by condenſing the circumambient air; and to bring in an account thereof in writing: And

To try the experiment of putting ſome ſprings with a weight both in the rarefying and condenſing engine, to ſee what force the different air hath upon them: and likewiſe to give in writing the experiment of weighing the air in the condenſing engine.

The operator was directed to have an earthen pipe ready for the next meeting, and to fire it red-hot, and then to blow it on one ſide, to ſee, whether any flame will be blown out at the other end.

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[k] Dr. **Pell** was rector of that pariſh, having been preſented to the living in 1661. **Newcourt's** Repertorium, vol. ii. p. 269.

[l] of Norwich, afterwards knighted.

[m] They are extant in n° 7. vol. i. Preſs 44.

February 3. At the Council were preſent,

The lord viſcount Brouncker,
 preſident.
Mr. Howard.
Sir Robert Moray.
Sir Paul Neile.
Sir Peter Wyche.
Mr. Aerskine.
Mr. Povey.
Mr. Balle.
Dr. Goddard.
Dr. Merret.
Dr. Whistler.
Mr. Hill.
Mr. Colwall.
Mr. Oldenburg.

Dr. Merret brought in the liſt of chirurgical inſtruments; and was deſired to mark thoſe of them, that are of chief uſe for the chirurgical operations intended to be made by the Society on dead bodies.

Sir Robert Moray moved, that every one of the Council might think on ways to raiſe a revenue for carrying on the deſign and work of the Society.

Dr. Whistler ſuggeſted ſeveral things for that purpoſe; *viz.* that his majeſty might be ſpoken to, that in every new grant ſomething might be ſtipulated for the uſe of the Society: That if any thing ſhould be found, that at preſent yielded no revenue to the king, the grant of it might fall to the Society: And that upon all philoſophical books printed in England ſome impoſition might be laid for the benefit of the Society.

At a meeting of the Society the ſame day,

John earl of Tweedale, propoſed by Sir Robert Moray, was elected and admitted: And

Mr. Roger Williams elected.

Mr. Povey preſented the Society with an Eaſt-Indian fan of tamarinds, retaining ſtill its aromatic ſmell, after having been kept by him for ſix months, beſides the long time of its tranſportation.

Mr. Hooke's account both of the weight of the air in a large receiver 119 Engliſh wine pints, and of the proportion of the weight of the air to the weight of the water, was read; and the latter was ordered to be repeated.

It was ordered, that whoever made report of an experiment but once made, ſhould repeat it, for the ſake of more accuracy and certainty.

Mr. Balle was deſired to inquire of Mr. Street, whether he had obſerved the ſun's eclipſe on the 18th of January of this inſtant year.

Mr. Boyle preſented the Society with a little bird, preſerved for ſeveral months in oil of turpentine; by which liquor, as he obſerved, bodies might be ſo kept, as that it may alſo appear what it is that comes away from them; there being found a liquor at the bottom quite diſtinct from the oil; which ſubſiding liquor being examined, would ſhew the quality of the matter ſeparated.

Mr. Balle acquainted the Society, that Mr. Darlington had found a metal yielding a glaſs, that tranſmits rays without burning. He was deſired to make farther inquiry into it.

Monſ. Vossius[a] communicated a relation of a child taken in Lithuania among bears in a bear-hunting, and then at the court of the queen of Poland, where endeavours were uſed to reduce the child to ſome humanity, whence it ſeemed to have altogether degenerated by its long converſation with wild beaſts. This relation was atteſted by a French gentleman, as an eye-witneſs, accompanying the two ſons of the marſhal de Grammond. Sir Robert Moray was deſired to make farther inquiry into the fact by a letter to Dr. Davison, living in thoſe parts.

Mr. Hooke was ordered to make the experiments of compreſſing water and glaſs, as alſo that of the ſwimming glaſs bubble, againſt the next meeting.

He mentioned, that he had expoſed ſprings to the free air; but that, notwithſtanding a conſiderable alteration in the air, he had not found any alteration in the ſprings.

Mr. Boyle ſuggeſted, that a ſpring might be bent to a certain degree, and put into a cylindrical glaſs, with ice and ſnow about it, to ſee what alteration would be wrought upon the ſpring.

Mr. Hooke was ordered to try ſprings with appendent weights, both in the rarefying and compreſſing engine, to ſee what effects the rarefaction and condenſation of the air produced in ſprings.

He related, that he had taken a piece of ice, and having ſhaped it into a lens, had found, that though it caſt the figure of the ſun upon his hand, yet it yielded no heat that was ſenſible. He was deſired to try with it, when there was an opportunity in froſty weather, a lenticular glaſs, whether it would yield any heat in ſuch a ſeaſon.

Mr. Boyle's diſcourſe concerning weather-glaſſes was read in great part; and the communication of it being deſired, it was anſwered by him, that he intended ſhortly to publiſh it in print.

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[a] Isaac Vossius, afterwards canon of Windſor.

February 10. At the COUNCIL were preſent,

The lord viſcount BROUNCKER, preſident.	Mr. PALMER.
	Dr. GODDARD.
Mr. HOWARD.	Mr. HILL.
Sir ROBERT MORAY.	Mr. COLWALL.
Sir PAUL NEILE.	Mr. HOSKYNS.
Sir PETER WYCHE.	Mr. OLDENBURG.
Mr. AERSKINE.	

It was ordered, that the preſident move the SOCIETY, to demand again a body for diſſection; as alſo to conſider of what may contribute to diving.

It was reſolved, that the form for the ſummons of the fellows of the Society for a diſſection be in the following manner:

" You are deſired to take notice, that there will be an anatomical adminiſtration " at Greſham college, to begin at ——— day, at ten of the clock preciſely."

The ways of raiſing a revenue for the Society being again conſidered of, Mr. HOWARD mentioned the ſoliciting a grant from the king of ſuch lands, as were left by the ſea. Sir ROBERT MORAY ſuggeſted, that his majeſty might be moved to grant to the Society the reverſion of the maſterſhip of the Savoy. Sir PAUL NEILE moved, that the king might be ſpoken to, to confer ſuch offices of the courts of juſtice, or the cuſtom-houſe, as were in his majeſty's grant, upon ſome of the members of the Society, for the uſe of the whole.

It was deſired, that thoſe members, who were lawyers, would inform themſelves about the vacancies and reverſions of the places of the law-courts; and Mr. COLWALL about places of the cuſtom-houſe, *&c.*

Mr. HOOKE being called in, and deſired to ſuggeſt ſome experiments, that might be acceptable and uſeful to the public, ſuggeſted, that the experiment of land-carriage, and of a ſpeedy conveying of intelligence, might be conſidered of.

At a meeting of the SOCIETY on the ſame day,

The experiment concerning the weight of air, and the proportion of the weight of air to that of water, was repeated; of which Mr. HOOKE was directed to give an account in writing at their meeting [a]. It was as follows:

" A large receiver, holding by meaſure 119 Engliſh pints, was, after a gage " (bye-and-bye to be deſcribed) hanged into it, cloſed up with a ſmall ſtop-cock, " and the air was pretty well exhauſted by the rarefying engine. Then, the cock " of it being well ſtopped, ſo as to keep the air from re-entring it, was very well " counterpoiſed in an exact pair of ſcales: then the ſtop-cock was returned, and

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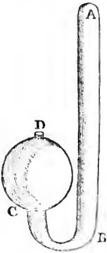
[a] Original Regiſter, vol. iii. p. 12.

“ the air admitted; ſo that the water returned into the longer ſhank of the gage, “ within $\frac{1}{24}$ of the top, and the receiver was found to be grown conſiderably hea- “ vier: the weights, that were added to the counterpoiſe, to bring it again to an “ equilibrium, amounting to 2 ounces, 1 drachm, 15 grains, averdupoiſe, almoſt.



“ The gage was made of a ſmall pipe of glaſs, of the “ ſhape repreſented in the figure A, B, C. The ſide A B “ was an even cylindrical pipe, full of air, cloſed at A; “ and the ball C was full of water, and the orifice D was “ left open, to let the air in or out, according to the exi- “ gency of the experiment; namely, as the ambient air “ in the receiver was rarefied, the air contained in the “ cylinder A B rarefied itſelf likewiſe, and broke out into “ the receiver through the water in C; ſo that the air in “ A B was always of the rarity with the ambient air in “ the receiver: but when the air was admitted into the “ receiver, it forced the water contained in C into the “ cylindrical pipe A B, and filled twenty-three parts of “ twenty-four of it, leaving only a ſmall bubble of air “ at the top, that filled $\frac{1}{24}$ part of the whole cylinder: “ whence we collect, that there was only $\frac{1}{24}$ part of the “ air, that had a little before filled it, when it was weigh- “ ed in the ſcales.

“ We weighed likewiſe a pint of water with the ſame accurate beam, and found “ it to weigh $18\frac{17}{32}$ ounces averdupoiſe; ſo that the weight of the water, that filled “ the whole receiver, amounted to $2105\frac{7}{32}$ ounces averdupoiſe: from which weight “ if we deduct $\frac{1}{24}$ part, we ſhall have very near $2017\frac{1}{2}$ ounces averdupoiſe, for the “ weight of a parcel of water, equal in bulk to the parcel of air admitted into the “ receiver, which weighed $2\frac{1}{8}$ ounces: that is, the weight of the air, to the weight “ of the water, is very near as 1 to $949\frac{7}{17}$.”

The preſident produced a letter, written to him by Mr. Flint, from Runton in Norfolk, giving ſome account of the iſlands of ice floating in the Iceland ſea, of an incredible profundity; and deſiring alſo a thermometer for his correſpondent there. It was ordered, that a couple of thermometers ſhould be made ready for that purpoſe, and carefully put up by the operator againſt the next meeting.

Sir Peter Wyche preſented the Society with the Life of Don John de Castro, tranſlated by him out of the Portugueſe into Engliſh.

Dr Goddard’s account of eggs, and the differences between new and ſtale, and the ſigns of each ariſing thence, was read, and ordered to be regiſtered[p], as follows:

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[p] Original Regiſter, vol. iii. p. 8.

“ Eggs of hens are in frequent uſe for diet, both in mixture for great variety of made diſhes, and alſo alone in the ſhells or out of them; which, ſince upon long keeping they become rotten, and contract ſo horrid a putrefaction, in reaſon they muſt be beſt, and to ſenſe they are found pleaſanteſt, that are neweſt: therefore the difference between new and ſtale, and the ſigns of each ariſing therefrom, have been ſought after and taken notice of; ſome of which are,

1. “ On the outer ſuperficies of the ſhell, a mealineſs or immunity from gloſs or ſhining, except it hath been ſoiled, and eſpecially with any fatty ſubſtance; which holds in all new-laid eggs, as the contrary doth in ſtale, though kept from ſuch ſoiling as before mentioned.

2. “ From the cavity between the ſhell and the membrane or ſkin involving the white, a good eſtimate may be made of the newneſs or ſtaleneſs of an egg. Perhaps ſome new-laid egg may want it (as ſome think none have it when firſt laid) but to be ſure it hath been found in others of the neweſt laid. If this cavity be ſuppoſed to be always about the great end of the egg, then the ſeeking and miſſing it there in ſome new-laid eggs may have given occaſion to deny it to be in ſuch; whereas it is certain, that many times it is ſeated on the ſide, far from the greater end, and ſometimes about the ſmaller; ſo that if this were not attended, it doth not from hence appear, that any egg, though never ſo new, ſhould want it. But as to the differences of this cavity in new and ſtale eggs, there are two, magnitude and figure: for the firſt, it is certain that, new-laid eggs have the leaſt cavities, which, upon keeping, ſtill grow bigger, till they reach to the yolk, and leave it bare on the part next to it, as appears in ſuch an egg boiled hard, And in ſummer time, or hot weather, the cavity enlargeth more in a day or two, than it doth in a far longer time in winter or cold weather, as in all other differences an egg doth ſtale faſter.

3. “ The figure of the cavity in a new-laid egg is ſpherical, ſo deep ſometimes as makes near an hemiſphere, like an impreſſion of half a pea, or a round body of that bigneſs: as the egg grows ſtaler, and the cavity larger (as was mentioned before) ſo it becomes alſo of a more irregular figure, ſpreading and growing in part to ſome riſing or convexity, for the moſt part in the middle; and ſometimes ſpreading large in circumference, without proportionable depth, ſo as to be convex, and parallel to the ſhell, only leaving a ſpace between it and the white; though otherwhile (as was ſaid, enlarging itſelf downwards, and reaching to the yolk: all which may be ſeen in hard boiled eggs, the part of the ſhell againſt the cavity being diſcovered againſt the light, and warily taken off.

“ For the more certain judging of the newneſs of an egg by the cavity, the magnitude and figure are both to be taken together; for though all new-laid eggs have ſmaller cavities, yet it is probable, that they are not all of the ſame exact bigneſs, but that they are all of a more regular ſpherical concave; becauſe it hath been obſerved, that one egg with a cavity ſomewhat larger, but withal deeper and more regular, hath been better taſted, and by all other ſigns newer

" laid, than another that had a cavity rather leſſer, but withal leſs regular as to " the ſpherical figure.

" The cavities of eggs may be ſeen, and their bigneſs diſtinguiſhed through " the ſhells, by holding them up between the eye and a quick lighr, ſhadowing " with the hand, that the light fall not on the ſide toward the eye: and thus in " a raw egg the cavity appears a darker, in a boiled one a lighter ſpot, than all " the reſt of the egg.

4. " From appearances in thew hites of eggs ſome ſigns of new and ſtale ones " may be made out, and that by looking through the ſhells; the whites in new- " laid eggs being moſt tranſparent when raw, and moſt opake when boiled; but " the thickneſs more than ordinary, and the equality of the thickneſs of the ſhell, " making a cloudy appearance, upon that account alone doth often hinder from " diſtinguiſhing at certainty in this way.

5. " The white of a new-laid egg raw being let out, upon breaking the ſhell, " a good part of it is fluid, thin, and running like water; in a ſtaler egg it ap- " pears all of a like conſiſtence.

6. " Of the like white boiled, except it be very hard, that next the yolk is " fluid, and like whey of milk, while rhe reſt is conſiſtent: of a ſtaler egg boiled, " the white is all uniform to ſenſe: the fluid part like water in the raw egg, and " whey in the boiled, is probably the ſame in both, *viz.* the inner part or region " of the white, which by curious anatomiſts and obſervers of eggs and chickens " in the ſhell, is not only accounted different from the outer region, but ſeparated " by a membrane, though inviſible, by reaſon of the thickneſs and tranſparency " thereof: which upon long keeping may be diſſolved, and the ſeveral ſubſtances " thereupon mix and be confounded together.

7. " In whites of eggs boiled to a conſiſtence, the colour of thoſe new-laid " is milky white, which renders them leſs tranſparent, as was noted before: " of thoſe that are ſtale, not ſo white, becauſe more tranſparent; the former " more reſembling the curd of milk, the latter ſome ſtiff jelly. This holds " generally in hens eggs, though ſometimes, yet very rarely, an egg with a " tranſparent white upon boiling (which by the cavity and all other ſigns, ſhould " be new-laid) hath been obſerved, perhaps from ſome difference in the feeding " of the hen; as in pikes and other fiſh, that are well fed, the fleſh is more milky, " white, and firm; leſs firm and more tranſparent in rhe reſt. In eggs of geeſe " and ducks, the whites are leſs milky white, and more tranſparent in the neweſt " laid, than thoſe of hens; yet the newer laid of them come nearer to hen-eggs.

8. " The whites of new-laid eggs harden ſooner upon boiling than thoſe of " ſtale; ſo that of a parcel of eggs boiled together, the hardeſt may be choſen " for the neweſt laid.

“ New-laid eggs are often obſerved to ſplit or crack their ſhells in boiling,
“ which may very probably be from the ſmallneſs of the cavity, not giving room
“ to the meat to dilate within the ſhell.

9. “ The poſiture of the yolk doth diſcover conſiderably, whether the egg be
“ newer or ſtaler; that is, if it be in or near to the middle, it is a ſign of the new-
“ neſs of the egg: and the farther it is removed from the middle, and the nearer
“ to any part of the ſhell (which oft-times it even touches) it infers that egg to be
“ the ſtaler: this is from the weight of the yolk ſettling down upon long lying
“ (whence by ſhogging it at the great end an egg may be made to ſtand on it,
“ upon a plain without cracking the ſhell) but hence it appears, that if ſtale eggs
“ be often removed, or eſpecially if turned on purpoſe, this ſign muſt fail.

10. “ The taſte of the yolk (for the white hath none ſenſible or conſiderable)
“ may be accounted a ſign of a new-laid egg, which is certainly much more plea-
“ ſant than that of a ſtale one, to thoſe that are accuſtomed to taſte eggs; but this
“ cannot be deſcribed. But all eggs of a like newneſs have not equal ſweetneſs
“ in taſte: which may probably vary upon the feeding of the hen; as the milk of
“ cattle or other creatures (to which the yolk of the egg hath analogy) is known
“ to do upon their feeding within a day, or a ſhort time; and the fleſh of all crea-
“ tures in uſe to be eaten, in a longer time.

“ The paler or deeper colour of the yolk is no ſign of the newneſs or ſtaleneſs
“ of the egg: it is commonly (and very probably aſſerted) that the difference is
“ from the age of the hen; that is, the younger hen lays the egg with the paler
“ yolk; and the elder, with the deeper coloured. As little is to be inferred from
“ the colour of the ſhells, which of ſome eggs is of a pure white, of others much
“ different towards yellow; whereof thoſe of this latter colour are ſaid to be laid
“ by fat hens: to be ſure in both kinds, as to the colour of yolks and ſhells, eggs
“ are to be found of the ſame newneſs.”

Dr. GODDARD mentioned, that the dog formerly cut of the ſpleen by Dr. CHARLETON was dead; and being opened, was found ſwelled by a conſiderable quantity of purulent matter, cauſed undoubtedly by the effuſion of blood, occaſioned by the not well cloſing of the veſſels cut from the parenchyma of the ſpleen. It was ordered, that the experiment be repeated with more care by Dr. CHARLETON.

Mr. BALLE gave ſome account of what Mr. STREET had calculated of the ſun's eclipſe on the 18th of January laſt, *viz.* that it ſhould begin at 7h. 39′ 59″ in the morning, and the ſun be covered about a tenth part.

Mention being made of the conjunction of Mercury with the ſun on the 25th of October following, it was ordered, that Dr. GODDARD, Dr. WHISTLER, Mr. BALLE, and Mr. HOOKE ſhould prepare for the obſervation: as alſo, that ſome of the curious in the Engliſh plantations of America, as Mr. WINTHROP in New England, Mr. NORWOOD in Bermudas, Capt. SILAS TAYLOR in Virginia, and Dr. HENRY STUBBE in Jamaica, ſhould be deſired to make the ſaid obſervation in thoſe parts.

Sir Paul Neile moved, that obſervations might be made of the ſun's figure in its riſing and ſetting about Covent-Garden, and at Deptford. The preſident was deſired to obſerve in Covent-Garden, and Mr. Evelyn at Deptford; or if the latter could not conveniently do it himſelf, to engage ſome perſons there or at Greenwich to do it.

Mr. Henshaw read the hiſtory of *lignum foſſile minerale*, as he had tranſlated it out of a treatiſe in Italian on that ſubject by Francesco Steluti. It was ordered to be laid up, together with the printed book preſented by him to the ſociety from Sir Robert Paston.

Mr. Southwell ſhewed the ſociety a part of the thorny ſafeguard of an American pumpkin, brought from America by the lord Windsor; and related, that with ſuch a ſubſtance the whole outſide of that fruit was ſo ſurrounded, that the birds, which otherwiſe would eat it all by reaſon of its ſweetneſs, could not come at it. It was delivered to the operator to be put into the repoſitory.

The preſident moving it to the ſociety, whether they would have a body again to diſſect at the next execution, it was ordered, that a warrant ſhould be drawn up for demanding a body; and that the phyſicians of the ſociety formerly appointed, ſhould meet and conſult, by whom and how the diſſection was to be managed.

Mr. Hooke was ordered to make the following experiments at the next meeting. 1. To immerge a ball in water, and to convey into it a continual ſtream of air. 2. To try the ſtrength of ſeveral kinds of wood, as to bending, toughneſs, *&c.* and to break them ſeveral ways, both length-wiſe and croſs-wiſe. 3. To try ſprings both in the rarefying and compreſſing engine.

The preſident moving it to the company, that the buſineſs of diving might be taken into conſideration as a thing, that would be, at that time eſpecially, very acceptable, if it could be reduced to practice, it was ordered, that his lordſhip himſelf, Sir Robert Moray, Sir William Petty, Dr. Wilkins, Dr. Goddard, Mr. Oldenburg, and Mr. Hooke ſhould be a committee for that purpoſe, and meet at the preſident's houſe on the Saturday following about ten of the clock, and make a report on the Wedneſday following.

Februray 17. The Council met, at which were preſent

The lord viſcount Brouncker,
 preſident.
Mr. Howard.
Sir Robert Moray.
Sir Paul Neile.
Sir Peter Wyche.
Mr. Balle.

Dr. Goddard.
Dr. Whistler.
Mr. Palmer.
Mr. Hill.
Mr. Colwall.
Mr. Hoskins.
Mr. Oldenburg.

The committee appointed February 3 for examining Mr. Balle's accounts reported, that they had examined them, and found Mr. Balle to have diſcharged his truſt with care and fidelity: Whereupon it was

Ordered, that the ſociety ſhould that day at their ordinary meeting be acquainted therewith, in order to return thanks to Mr. Balle.

It was ordered alſo,

That the preſident be deſired to move that afternoon to the ſociety the buſineſs of diſſecting a body:

That upon Sir Peter Wyche's moving, that Dr. Charleton's lectures upon the muſcles might be printed, Dr. Charleton ſhould be deſired to give in the ſaid lectures to the council for farther conſideration and order concerning them:

That Mr. Hoskyns bring in at the next meeting of the council a report in writing concerning the ſtatutes of the ſociety:

That Mr. Hooke ſet down in writing and produce to the council his whole apparatus and management for ſpeedy intelligence: And

That Sir Robert Moray and Mr. Evelyn give a viſit to Col. Blunt, and confer with him concerning the improvement of land-carriage.

At the meeting of the Society the ſame day,

Mr. Williams was admitted.

The experiment of applying a bell or hogſhead with air under water by means of two buckets, was tried in little, and ſucceeded. Whereupon Mr. Hooke was ordered to get a model made againſt the next meeting of the bag, which was to be about the body of the diver for continual inſpiration; which bag being emptied, he was to repair into the bell, as a magazine for a new ſupply of air to fill the bag with.

For ſeeing under water, Mr. Hooke propoſed a pair of deep convex ſpectacles.

It was ordered, that the ſecretary produce at the next meeting Mr. Rochefort's account of diving: And

That a full-grown dog be provided by the operator for cutting out the ſpleen, to be performed by Dr. Charleton at the next meeting.

Sir Robert Moray's directions for the obſerving of the conjunction of Mercury with the ſun on the 25th of October 1664, were read, and ordered to be ſent to Bermudas and the other places formerly named, together with the letter drawn up by the ſecretary, and read before the ſociety.

It was ordered, that the ſecretary ſhould let Dr. Wallis know, that it was the deſire of the ſociety, that he ſhould write as from himſelf to Monſieur Hevelius of Dantzick, and to recommend to him the obſervation of the conjunction of Mercury with the ſun.

Mention being made of Mr. Horrox's[p] papers concerning celeſtial obſervations, Sir Paul Neile promiſed to produce ſome of them: and Dr. Croune was deſired to write to Mr. Townley, who had a conſiderable number of Mr. Horrox's papers, to communicate them, in order to their being made public.

Sir Robert Moray mentioning, that Monſieur Huygens deſired to know of what ſize the tubes were, in which the experiment of the quickſilver remaining ſuſpended ſo high above the ordinary ſtation was made, and whether they were perfectly cylindrical, or had the orifice ſomewhat ſmaller than the reſt; the preſident and Mr. Boyle were deſired to repeat the experiment, and to obſerve the ſize and orifice of the tube for the ſatisfaction of the queries above-mentioned.

It was ordered, that a ſummons be drawn up by the ſecretary, and ſent by the operator to the phyſicians of the ſociety to meet together on the Saturday following, the 20th of February, about three of the clock in the afternoon in Dr. Goddard's lodgings, to conſult about the managing of the next diſſection. The ſummons was accordingly drawn up, and delivered to the opertor.

Mr. Boyle mentioning, that the committee of phyſicians formerly appointed for anatomical adminiſtrations might be deſired to conſider of and bring in an account of the *Deſiderata* of anatomy, it was ordered, that they ſhould take this matter into their conſideration, and give an account of it to the ſociety.

He ſuggeſting, that Dr. Croune had conſidered of the proportions of the bones and other parts of animals as to their length and weight, the ſociety deſired the doctor to bring in his obſervations on this ſubject, which he promiſed to do.

Dr. Charleton mentioned, that Bellonius and Leonardo la Vinci had done ſomething upon that ſubject.

The preſident acquainting the ſociety, that Mr. Balle had given up his accounts to the council, and was by them found to have diſcharged his truſt faithfully, the ſociety gave Mr. Balle their thanks for his care and pains taken in his treaſureſhip.

Sir Robert Moray produced two ribbands dyed with a colour extracted out of a yellow wood of Jamaica; and was deſired to give ſome of that wood to Mr. Boyle for farther trial.

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[p] Jeremiah Horrox, born at Toxteth, a ſmall village near Liverpool in Lancaſhire, and educated at Emanuel College in Cambridge, began about 1633 to apply himſelf to aſtronomical obſervations.

A letter from Mr. Beal to the ſecretary was read concerning Capt. James's voyage and wintering in Charleton iſland in Hudſon's Bay: as alſo ſome obſervations of his own about the art of tanning, which were ordered to be regiſtered *, as follow:

“ Now I ſhall give you ſome brief account of the art of tanning and dreſſing of
“ dog-ſkins. The ſkins of the biggeſt maſtiffs are fitteſt to be tanned for boots or
“ ſhoes, or thick riding gloves, and are held to be ſtronger and have a finer grain
“ than any Spaniſh or Barbary leather; but they are cold and moiſt, fitteſt for
“ ſummer; and old fame reports them to beget the palſy. Hunting-hounds and
“ grey-hounds and water-ſpaniels yield the ſofteſt and moſt limber and pleaſant
“ leather: the ſkins of leſſer dogs are not ſo fit to be tanned, as to be dreſſed white
“ for gloves.

“ In tanning, lime it quick, *viz.* let it lie not above a fortnight or three weeks
“ in lime, taking it out of the lime-pits once every day for an hour or more all
“ theſe three weeks: then put it for a week in a pit of weak ooze (which is the
“ water, in which the bark of oak lies bruiſed) taking the ſkins alſo once every day
“ (as before) out of the ooze for an hour, *&c.* Then it ſhould be tanned up in
“ the ſtrongeſt ooze: the quicker it is tanned, the better it is and ſtronger: by
“ long tanning it rots. If it lie three weeks or a month in the ſtrongeſt ooze
“ (taking it out but once a week) 'tis then beſt to take it up as ſoon as it
“ is tanned enough. Then hang it on poles, as plain as may be, till the ſun
“ and wind dries it, which may be in two days of good weather: if it ſhould
“ rain, it muſt be dried within doors. If the horn (as they call it) be quite out,
“ *viz.* if it be not ſtiff and horny, you may take it out at the third laying in this
“ ſtrong ooze. If ſome parts do obſtinately continue horny, the horn may be
“ taken out thus; take for each ſkin half a pound of allum, and a like quantity
“ of ſalt, diſſolve it in fair water, and bathe the horney parts often in it, in ſome
“ earthen or tin'd veſſel. This is neceſſary to be done to leather, that is tanned for
“ gloves, not for boots or ſhoes.

“ To dreſs white for gloves, it muſt be better limed, *viz.* lie a week longer
“ in the lime: after it is taken out of the lime, it muſt lie in warm water mingled
“ with bran; ſo let it lie three days together without ſtirring it; then let it lie one
“ day in the infuſion of allum and ſalt above-mentioned; then dry it ſmooth
“ upon poles.

“ Cat-ſkins are dreſſed as dog ſkins; but if you would ſave their furs, you muſt
“ not put them in lime at all (but in fair water, in which bran is boiled, and then
“ cooled before you put the ſkins in) in which they muſt lie for two or three days.
“ So alſo ſquirrels-ſkins, and thus are dreſt ſeal-ſkins with the hair on, for the
“ covers of ſaddles, *&c.* in which care muſt be had, that the liquor, in which your
“ bran is, be not too warm, but cooled thoroughly, before the ſkin be put in. A
“ boar's ſkin will be thicker than a bull's ſkin, and cannot be tanned limber, but

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* Original Regiſter, vol. iii. p. 14.

" is always horny. All caſtling ſkins may be dreſt (as above) white for gloves. " If dogs-ſkins be not tanned very quick, as above directed, they will not hold any " colour in perfection.

" Some cat-ſkins (as I am told by a very great wit) yield a very rich fur; I " take it, it was of fox-colour and perfect ſables mingled, and rather in dapples " than undulate as the Cyprian. If any of theſe ſkins ſhould have a dead tanning " (ſo they call a ſlow tanning) as calves-ſkins, they will be ſo rotten, as not to " hold ſtitch.

" To take out the allum aforeſaid, mingle the yolks of eggs and oatmeal in fair " water, and in that liquor let the leather lie a few hours, and then waſh it well " therein, and ſo dry it. My man intends to try his ſkill upon eel-ſkins and " conger-ſkins, which without dreſſing are much ſtronger than any known leather, " and may be fit for pumps, as leſſer eel-ſkins for flails."

It was ordered, that the lawyers of the ſociety be a committee for peruſing the ſtatutes of England, in order to extract from thence whatever had been ordered therein concerning manufactures, and the abuſes and frauds committed therein.

Mr. WILLIAMS was deſired to bring in his obſervations of the curioſities and rarities of England.

Mr. HOOKE was ordered to prepare againſt the next meeting three veſſels, one with common air, another with exhauſted air to a certain degree, and a third with compreſſed air to the like proportion; and to try in them ſome animals, to ſee how long they would live in ſuch veſſels.

He was put in mind of the experiment of trying the ſtrength of ſeveral kinds of wood; upon which Mr. BOYLE ſuggeſted, that in the trial notice might be taken of the time, when the wood was cut.

February 24, being Aſh-Wedneſday, the council did not meet; and by reaſon of the anatomical adminiſtration of the ſociety happening to be on this day, the meeting was adjourned till the Wedneſday following, the 2d of March.

March 2. At the meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER, preſident.
Sir PAUL NEILE.
Sir PETER WYCHE.
Mr. AERSKINE.
Mr. BALLE.
Dr. WILKINS.
Dr. GODDARD.
Dr. WHISTLER.
Mr. PALMER.
Mr. HILL.
Mr. COLWALL.
Mr. HOSKYNS.
Mr. OLDENBURG.

Mr. HOSKYNS brought in writing the report of the committee for reviewing the ſtatutes of the ſociety, *viz.*

" The 19th of December, 1663.

" At a committee for reviewing the laws.

" This committee is of opinion, that it is the intereſt of the ſociety to have no
" complete body of laws; but that ſuch orders be from time to time made, as
" the ſtate of affairs ſhall neceſſarily require; and that the laws already made be
" kept private.

" JOHN HOSKYNS."

It was ordered upon this report, that in purſuance of an order of the council of December 21, the ſame committee bring in their ſenſe upon particular ſtatutes.

The king's reception being again conſidered of, it was ordered, that Sir ROBERT MORAY, Dr. WILKINS, Dr. GODDARD, Dr. MERRET, Dr. WHISTLER, and Mr. HILL be a committee to prepare ſuch experiments, as might be fit for that purpoſe, and do meet accordingly on Mondays in the afternoon at Greſham-College.

It was ordered, that all thoſe of the ſociety, who ſhould print any books of a philoſophical nature by order of the ſociety, be deſired to own themſelves in the title page fellows of the ſociety.

A motion being made by Mr. HOSKYNS, that the ſociety might print and vend to their advantage the books to be printed by any of their fellows, and by their order; it was reſolved, that this propoſition ſhould be again conſidered of, when any book of note ſhould be offered to the preſs by any fellow.

At the meeting of the SOCIETY on the ſame day,

The experiment with birds put in common, rarefied, and compreſſed air being made again, and it being found, that the bird in the common air was well; that in the rarefied, panting, and that in the compreſſed air, dead, the laſt was opened, but no water found therein: which ſince ſome of the members thought an argument againſt the bird's being drowned, it was ordered, that the experiment with the bird in the compreſſing engine ſhould be tried the third time, putting the bird in a little cage, at the next meeting.

Mr. HOOKE produced his bellows to be uſed under water for taking in air; but propoſed withal another way conceived by him to be better and ſafer than that with bellows, *viz.* with two cylinders open at one end, and having two pipes, by which the air is taken out of the one and put into the other. It was ordered, that two ſuch cylinders be made, and when ready, a waterman hired to try the experiment.

It was ordered, that Dr. CHARLETON cut the ſpleen out of a dog at the next meeting; and that the operator provide a dog for that purpoſe.

The phyſicians of the ſociety, who had employed themſelves in the late diſſection of an human body, *viz.* Dr. Goddard, Dr. Charleton, and Dr. Clarke, received the thanks of the ſociety for their diligence and pains; and were deſired to continue the ſame upon the like occaſions, and to conſider among themſelves from time to time what to proſecute, and how to divide taſks.

Sir Robert Moray produced a paper, containing the deſcription of a way invented by his highneſs prince Rupert to make hail-ſhot of different ſizes; which was read, and ordered to be regiſtered [r].

Dr. Pell made known his deſire to the ſociety by Mr. Haak (himſelf being hindered from being preſent) that the ſun's apparent meridian altitude might be obſerved on the 10th and 11th days of this month of March, in order that the ſociety might be enabled by their own obſervations to examine other men's predictions of the day and hour of the ſun's entrance into Aries. Hereupon it was ordered, that Sir Robert Moray, Mr. Balle, Mr. Henshaw, and Mr. Neile ſhould be curators of this obſervation to be made on the top of Weſtminſter-Abbey on the days above-mentioned, taking in the 8th and 12th days.

Upon a ſecond conſideration of Monſieur Hevelius's Latin letter to Mr. Oldenburg from Dantzick, January 4, 166⅔, N. S. [s] deſiring, that the Royal Society would tranſmit to him a Latin tranſlation of a manuſcript in the Perſic language, containing a catalogue of the fixt ſtars by Ulug Beig [t], an eaſtern prince and aſtronomer; it was ordered, that Dr. Wilkins ſhould be deſired to write to Dr. Wallis to procure the ſaid tranſlation, in order to be ſent to Monſieur Hevelius.

March 9. At the meeting of the Council were preſent

The lord viſcount Brouncker, preſident.
Sir Robert Moray.
Sir Paul Neile.
Mr. Aerskine.
Dr. Wilkins.
Dr. Whistler.
Mr. Palmer.
Mr. Hill.
Mr. Colwall.
Mr. Oldenburg.

It was ordered, that any three or more of the council, who ſhould firſt meet on the Wedneſday following at the uſual time, ſhould conſider of an order to be drawn up and offered to the council concerning the power, which might be given to a committee of the council, to diſcourſe of and prepare matters concerning the ſociety, againſt the time that a quorum of the council be aſſembled.

Sir Paul Neile mentioning, that Sir Ellis Leighton had ſome propoſals to make for the benefit of the ſociety, but deſired to confer privately with ſome few members about it, it was ordered, that the Preſident, Sir ROBERT MORAY, Sir PAUL NEILE, Mr. AERSKINE, and Dr. WILKINS, be impowered to meet Sir ELLIS, and confer with him from time to time, and act in the name of the council for the benefit of the ſociety in things, that required ſecrecy and expedition.

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[r] Original Regiſter, vol. iii. p. 16. It is printed in Mr. Hooke's *Micrographia*, p. 22.

[s] Letter-book, vol. i. p 114.

[t] He was nephew to Tamerlane, and flouriſhed about the year 1436.

It was moved, that the king might be deſired by the Preſident, Sir ROBERT MORAY, and Sir PAUL NEILE, to give a rule to the two ſecretaries of ſtate, that all the propoſals, that ſhould be made concerning mechanical inventions, be referred to the council of the ſociety, to be examined by them, whether they were new, true, and uſeful.

Dr. WILKINS made a report of what the committee for preparing experiments for the king's reception had begun to do, *viz.* diſpatched the artificial eye; contrived ſome optical pictures, and deviſed how to caſt a picture upon a wall in a light room; moving withal, that Dr. MERRET and Dr. WHISTLER might be exhorted to meet conſtantly with the committee.

Sir ROBERT MORAY moved, that the council would make it their buſineſs to get an intereſt in Chelſea College[u], and to procure the reverſion thereof. Whereupon it was ordered, that the archbiſhop of Canterbury[w] ſhould be ſpoken to by the biſhop of Exeter[x], Dr. WILKINS, and Dr. PELL, to give his conſent to have the ſaid college applied to the uſe of the ſociety: as alſo, that Sir ROBERT MORAY make farther inquiry of Mr. COLE concerning the terms of parting with the intereſt, which he had in it.

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[u] This college had been founded by king JAMES I. for *the defence of the true religion eſtabliſhed within the realm, and for the refuting of errors and hereſies repugnant unto the ſame*; and the members of it were incorporated by the name of *the Provoſt and Fellows of the college of king* JAMES *in Chelſea near London*, who beſtowed on it by his letters patents the reverſion of good land in Chelſea, then in poſſeſſion of CHARLES earl of NOTTINGHAM, who had a long leaſe thereof; together with a capacity of receiving from his majeſty, or any of his ſubjects, lands not exceeding in the whole the yearly value of 3000l. The fabric of this college was begun on a piece of ground called *Teamſhot*, containing about ſix acres, and then in poſſeſſion of the earl of NOTTINGHAM, who granted a leaſe of his term therein to the provoſt at the yearly rent of 7l. 10s. King JAMES laid the firſt ſtone thereof, and gave all the timber requiſite thereto out of Windſor Foreſt; but the building was never completed, according to the deſign. Dr. MATTHEW SUTCLIFFE, dean of Exeter, who conveyed to this college farms to the value of 300l. a year, was appointed by the king, May 8, 1610, provoſt of it; and the fellows of it were ſeventeen divines of eminent learning, to whom were added WILLIAM CAMDEN, clarencieux, and JOHN HAYWARD, L. L. D. as hiſtorians for tranſmitting the affairs of church and ſtate to poſterity. In the parliament, which met at Weſtminſter, February 19, 16$\frac{9}{10}$, and ſat till July 23, 1610, an act was paſſed enabling the provoſt and fellows to dig a trench out of the river Lee, to erect engines, water-works, &c. to convey water in cloſe pipes under ground unto the city of London and ſuburbs thereof, for the perpetual maintenance and ſuſtentation of the ſaid provoſt and fellows, and their ſucceſſors, by the rent to be made of the ſaid water ſo conveyed. And in 1616 the king ſent his letters to the archbiſhop of Canterbury to excite all the clergy of his province to contribute to it: but the ſum thus collected was but ſmall; and the deſign of the college was defeated, and came to nothing. See Dr. FULLER's Church hiſtory of Britain, B X p. 51—55; Dr WILLET's Synopſis Papiſmi, p. 1221, edit. 1613; HOWES's Chronicle, p. 1057, edit. 1631; and COLLIER's Eccleſiaſtical Hiſtory, vol. ii. p. 697.

[w] Dr. GILBERT SHELDON.

[x] Dr. SETH WARD.

At the meeting of the Society the ſame day,

Dr. Charleton cut the ſpleen out of a living dog with good ſucceſs.

The experiment of ſhutting up a bird in condenſed air was tried again with this ſucceſs, that the air being compreſſed to half the ſpace, and double the quantity of air being forced into the cavity of the engine, the bird ſeemed to be pretty well in it, having continued therein from twelve of the clock till four in the afternoon of that day.

It was ordered, that the trial be repeated, by compreſſing the air as far as ſafely could be done, to a treble and quadruple, with the bird in it.

Sir Robert Moray mentioned a perſon, who had done very notable feats under-water in a bell, at 24, 25, and 26 fathoms depth, as taking ballaſt out of a ſhip, ſawing aſunder the decks of ſhips, in order to the taking out of guns, *&c.* but that at the depth of 24 fathoms, he uſed to fall into a ſwoon, and by the compreſſion of the ſpirits bleed at his noſe, ears, and eyes. Sir Robert Moray was deſired to procure the whole ſtory of this matter, with all the particulars, in writing, which he promiſed to endeavour to do.

He obſerved, that this diver deſired to be directed, how to convey a good number of barrels under water at a great depth, for the raiſing of ſunk ſhips.

Mr. Hooke produced the leaden boxes to be uſed under water, for furniſhing of air by a couple of pipes, whilſt the diver comes out of the bell or tub, and walks up and down working: which air being ſpent, the diver enters again into the tub or bell for a freſh ſupply.

It was ordered, that the experiment be made under water with thoſe boxes; and that Mr. Evelyn inquire after the diver about Deptford for this purpoſe.

Dr. Merret produced a fiſh called *lupus marinus* by Swingfield, and caught in the Elbe, which hath double teeth round about its mouth, and even in the roof of it; ſerving to diſcover a vulgar error concerning toad-ſtones, which the doctor ſaid to be nothing elſe but the teeth of this kind of fiſh, having ſhewn them to ſeveral goldſmiths (who acknowledged them to be the ſame with the ſuppoſed toad-ſtones) and made ſeveral chemical trials upon them, which confirmed theſe teeth and toad-ſtones to be the ſame thing. In the mean time, Mr. Palmer, Mr. Haak, and others, who had toad-ſtones, were deſired to produce them at the next meeting, to compare them with theſe teeth.

It was ordered, that Dr. Merret and Dr. Charleton conſider and make a catalogue of what is moſt deſirable of all ſorts of animals for the repoſitory of the Society, both exotic and domeſtic; and withal, to give directions, how to prepare them as to their ſkins, when dead; concerning which, Dr. Mrrret ſuggeſted, that the duſt of pepper was good to dry out all their moiſture after eviſceration.

Others propoſed, that Mr. CREW's preſerving powder, an account of which was formerly brought in by Dr. CHARLETON, might be ſent into thoſe parts, whence ſuch animals are to be tranſported hither.

Mr. BOYLE ſuggeſted, that ſeeing animals of remote parts have particular and conſiderable inward contrivances, ſome liquor, as ſpirit of turpentine, might be thought upon, and ſent abroad for the preſervation of the internal parts, at leaſt in ſmaller animals.

It was ordered, that Mr. POVEY, Mr. COLWALL, Dr. BALLE, and Mr. HILL be deſired to take care of ſending into foreign parts for ſuch animals, as they ſhould be directed, from time to time, by Dr. MERRET and Dr. CHARLETON.

Dr. MERRET moved, that in the firſt place notice ſhould be taken, and a collection made, of all the rare productions of England, as to beaſts, birds, fiſhes, vegetables, minerals, *&c.* concerning which he was deſired to give all poſſible aſſiſtance himſelf, as having taken great pains in it already.

Dr. CHARLETON ſuggeſted, that Mr. MAY ſhould be ſpoken to, that he might let the Society have all thoſe fine exotic birds of the king, that ſhould die.

Sir ROBERT MORAY mentioned, that his majeſty had the curioſity of weighing himſelf very frequently, in order to obſerve the ſeveral emanations of his body before and after ſleep, tennis, riding abroad, dinner and ſupper; and that he had found, that he weighed leſs after tennis by two pounds three ounces (but his majeſty drinking two draughts of liquor after play, made up his weight) after dinner, more by four pounds and an half.

Sir ROBERT MORAY related, that he had heard from Dr. HINTON of a copulation of a male rabbit and a female cat, which produced monſters, whoſe foreparts were like a cat, and the hinder parts like a rabbit; and that thoſe monſters had reproduced more complicated monſters: of all which he hoped to procure a fuller account in writing.

Dr. CHARLETON related, that he had once taken out of a woman a very miſſhapen maſs of a child, of twenty-three pounds weight, having no bones at all, nor head, nor heart, which, he ſaid, he had then ſhewn to the preſident and to Dr. PRUJEAN. He was deſired to bring in writing the whole ſtory, atteſted by Dr. PRUJEAN, the preſident not well remembering the ſhape of the ſame.

Dr. WILKINS propoſed, that Mr. FRANCIS WILLUGHBY, a fellow of the Society, and Mr. JOHN RAY, now both in Italy [a], and intending for Spain, might be deſired to paſs from Cadiz to Teneriffe, and there make thoſe experiments and obſervations formerly directed by ſome members of the ſociety, and recorded in their books. This motion was well approved, and the propoſer deſired to write to Mr. Willuohby and Mr. Ray to that purpoſe, and to ſend them a copy of thoſe directions, as they are regiſtered, together with the apparatus of inſtruments for ſuch performances.

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[a] Mr. RAY, in his *Obſervations made in a journey through part of the Low Countries, Germany, Italy, and France*, printed at London in 1673, in 8vo, obſerves, that Mr. WILLUGHBY and himſelf paſſed from Dover to Calais, April 18, 1663, and came to Venice in the beginning of October of that year.

Sir Robert Moray mentioning, that Dr. Wallis had ready the catalogue of the places of the fixed ſtars aſſigned by Uluo Beig, and deſired by Monſ. Hevelius, it was ordered, that it ſhould be ſent to the latter, together with a letter to be drawn up by the ſecretary, acknowledging his civility to the Society, and encouraging him to the proſecution of his celeſtial obſervations.

Sir Robert Moray moving, that the whole book of Ulug Beig, being aſtronomical, might be tranſlated, and both the Perſian original and the tranſlation printed together, if Mr. Allestry would undertake the printing; it was ordered, that he ſhould be ſpoken with by Dr. Wallis concerning it, and told, that the members of the Society would take every one a copy thereof.

Some perſons having been, in the preceding meeting, appointed to obſerve the ſun's entrance into Aries, Dr. Wallis was deſired to join with them therein.

Sir Robert Moray produced the ſcheme of a comet ſeen at Gratz [a] the 2d of January, 166$\frac{3}{4}$, the firſt time, and at Rackelſburg and Czackathurn, Jan. 17, riſing after midnight, and appearing till the break of day, of the ſame colour with other ſtars, but having the figure of an half-moon in the middle of its body, and the tail ſtanding northward.

March 16. At a meeting of the Council were preſent,

The lord viſcount Brouncker.
Mr. Howard.
Sir Robert Moray.
Sir Peter Wyche.
Mr. Aerskine.
Mr. Balle.
Dr. Wilkins.
Dr. Goddard.
Mr. Hill.
Mr. Colwall.
Mr. Oldenburg.

It was ordered, that Dr. Goddard and Mr. Palmer viſit Mr. Ellise, to deſire him, from the Council, to peruſe and conſider the ſtatutes of the Society.

The preſident, Sir Paul Neile, and Sir Robert Moray were deſired to be vigorous in proſecuting the buſineſs of Chelſea-college, and in putting a ſtop to his majeſty's grant to Mr. Sutcliffe for pulling down the houſe; and to procure from Mr. Cole and Mr. Sutcliffe an information of the ſtate of the whole matter concerning the foundation.

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[a] In Stiria.

At the meeting of the Society on the ſame day,

Mr. Gilbert Burnet was propoſed candidate by Sir Robert Moray; and

Mr. James Carkess by Dr. Wilkins.

Sir Paul Neile preſented a copy of ſome of Mr. Horrox's aſtronomical papers; which Dr. Wallis was deſired to peruſe, who accordingly took them with him to Oxford.

Dr. Wilkins and Dr. Croune deſired to procure the originals of thoſe papers from Dr. Worthington.

Dr. Croune took notice, that he had written to Dr. Power to ſpeak with Mr. Townley [b], concerning ſome writings of Mr. Horrox.

Sir Robert Moray exhibited a letter of Monſ. Huygens to him, dated at Paris, 20 Feb. 166$\frac{4}{5}$, N. S. [c] containing an account of the experiment of the mercury's remaining ſuſpended above the ordinary ſtation; and of ſome gentlemen of Paris pretending to know the cauſe of that phænomenon.

Mr. Hooke gave an account of the experiment of the laſt meeting, wherein the air having been compreſſed to half the room, the bird incloſed in the veſſel for the ſpace of about ten hours, was, at the end of that time, taken out very lively, and continued ſo till the next morning, but then began to ſicken, and died towards evening.

It was ordered, that this experiment ſhould be repeated at the next meeting to a greater degree of compreſſion:

That ſeveral kinds of wood be broken at the next meeting: And

That the operator ſhould provide againſt the ſame time ſome tadpoles, to be put into the rarefying-engine; as alſo to obſerve what Dr. Charleton ſuggeſted, of their being frogs, when the ſkin is ſtripped off.

Dr. Charleton mentioning, that toads have a long bony ſubſtance in their heads, dividing the brain, beſt to be ſhewn when there are ants to eat the ſkulls of toads clean, he was deſired to ſhew this obſervation at the proper ſeaſon.

He informed the Society, that the woman, out of whoſe belly the monſtrous maſs, mentioned by him at the preceding meeting, was taken, had promiſed to come herſelf and atteſt the ſact at the next meeting.

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[b] Christopher Townley, of Carr in Lancaſhire, eſq; a zealous promoter of mathematical and aſtronomical ſtudies, and the friend of Mr. William Milbourne, curate of Branceſpeth in the biſhopric of Durham, Mr. William Crabtree, a clothier, of Broughton near Mancheſter, and William Gascoyne, of Middleton in Yorkſhire, eſq; as well as of Mr. Horrox; all of whom were brought into the acquaintance of each other by means of Mr. Townley.

[c] Letter-book, vol. i. p. 119, 120.

Sir Robert Moray related, that he had been informed by the French ambaſſador, that there was at that time a diver at Dieppe able to ſtay one or two hours, and longer, under water, and to take out of ſunk ſhips things of value; as he had ſaved out of a ſhip under-water a box with 40000 gilders in it; uſing a head-piece wide only about the mouth, and a ſuit of leather well ſtopped and tied about him. Sir Robert ſuſpected, that this diver might uſe a piece of ſponge dipt in oil, and hold it in his mouth. He was deſired to inquire farther into this matter.

Mr. Hill was deſired to inform himſelf of the truth of the way uſed by the divers of Thoulon, Genoa, and Ormus; and to conſult Purchas concerning them, and the art they uſe in ſtaying under water.

Sir Robert Moray being called upon, for a written account of diving and working under water, promiſed to have it ready againſt the next meeting: as likewiſe the other account of inſtruments to take ballaſt out of ſhips, and to widen the open places of the decks of ſhips under water.

He mentioned, that there was come to prince Rupert a rare mechanician, who pretended to raiſe water to what hight he pleaſed by ſuction; to make a piſtol, ſhooting as faſt as it could be preſented, and yet to be ſtopped at pleaſure; and wherein the motion of the fire and bullet within was made to charge the piece with powder and bullet, to prime it, and to bend the cock: to make a wind-gun no bigger than one's thumb, to ſhoot a needle through a piece of an oak three inches thick without a noiſe; and ſo a pin through the heart of a dog without killing him: and to make a gun, that ſhall ſhoot as far as any other gun, and charging it with common powder, the ſhooting ſhall make no flame, nor ſmoke, nor noiſe, and ſhoot as far as ordinary guns. Sir Robert Moray was deſired to obſerve the performances of this artiſt, and to report them to the Society.

The operator giving notice, that there was a man preſenting his ſervice to dive, it was ordered, that he ſhould be ſpoken to for that purpoſe, as ſoon as the ſeaſon would permit; which was done accordingly by Mr. Hooke.

Dr. Balle produced a toad-ſtone, to compare with the teeth of the fiſh brought in by Dr. Merret at the former meeting. Mr. Palmer and Mr. Hooke, and all who had any ſuch ſtones, were deſired to bring in theirs alſo, in order to be compared.

Mr. Boyle mentioned, that many of theſe ſtones being collected together, it might eaſily be tried, whether they were animal ſubſtances or not.

Dr. Wilkins produced a letter of Mr. Marshall, concerning the preſerving of birds by opening them, and laying lime-duſt upon the fleſh of them, ſo that it might dry up all the moiſture; which being done, their feathers would keep their beauty and faſtneſs. Fiſhes and flies might be preſerved by drying them in the ſun.

He ſhewed the hair of an elephant, which was delivered to Mr. Hooke to be examined in a microſcope.

Dr. Croune was deſired to inform himſelf from Dr. Pugh, about the beſt ſeaſon of the year to mount the Pico Teneriffe.

Sir William Petty mentioned a way of meaſuring the hight of the Pico; which he promiſed to give an account of at another meeting.

March 23. At a meeting of the Council were preſent,

The lord viſcount Brouncker, preſident.
Sir Robert Moray.
Sir Paul Neile.
Mr. Aerskine.
Mr. Balle.
Mr. Palmer.
Dr. Wilkins.
Dr. Goddard.
Dr. Whistler.
Mr. Hill.
Mr. Colwall.
Mr. Oldenburg.

It was ordered, that Sir Robert Moray and Sir Paul Neile be deſired to conſult with the lord Ashley, whether it may be fit to deſire the king to give a rule to the two ſecretaries of ſtate, that all the propoſals, that ſhall be made concerning mechanical inventions, be referred to the Council of the Royal Society, to be examined by them, as to their novelty, reality, and uſefulneſs.

Sir Robert Moray was deſired to procure a full information concernidg Chelſea-college; which he promiſed to do.

It was judged better, that the king might give a grant of Chelſea-college firſt to another perſon, and that the Society ſhould then purchaſe it from ſuch a donee, than that they ſhould get it for themſelves directly.

Mr. Hooke was ordered to expedite his engine with one wheel, for eaſy and ſpeedy carriage; as alſo his circular hour-glaſs, with ſeveral cells therein; and his picture on a wall in a light room.

It was ordered, that Mr. Hooke produce at every meeting of the Society one of his microſcopical diſcourſes, in order to their being printed by order of the Society. And that ſeveral committees be appointed for the conſideration and improvement of ſeveral ſubjects of philoſophy.

At the meeting of the Society the ſame day,

Mr. Burnet and Mr. Carkess were elected and admitted.

Dr. Goddard's account of an experiment of ſpirit of wine, in a veſſel exhauſted of air, was read, and ordered to be regiſtered [d], as follows:

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[d] Original Regiſter, vol. iii. p. 18.

" In order to the making of this experiment, conſideration was had, how to " eſtimate the ſtrength of ſpirit of wine; and the way reſolved on was, by com- " paring the weight of it with that of water: and here the manner of weighing " and the ſort of water were to be thought on. The former was, by taking the " ſame dimenſions or meaſure of both as exact as could be, to the leaſt ſenſible " difference; which was done by a glaſs vial, containing ſomething above two " ounces of water, with a ſmall mouth and even neck (ſo ſmall that water would " not run out of it inverted) which being filled, a drop, more or leſs, would " make a ſenſible difference, by rendering the ſurface convex or concave. This " vial filled one time with ſpirit of wine, and another time with water, was weigh- " ed in a balance, which charged with four ounces at each end, would ſhew ma- " nifeſtly with ¼ of a grain, and ſenſibly with leſs; but for better certainty, no " leſs than ¼ of a grain was taken notice of in the account. As to the water, " trial was made of two ſorts by weight, pump-water and conduit-water, the " former whereof weighed about one grain in an ounce heavier; which difference " is ſufficient to render it ſo much fouler-taſted and harſher than the other. The " other therefore being in reaſon purer, by the lightneſs, as well as to ſenſe, by " ſweetneſs and other qualities, being determined on for trial, was diſtilled in bal- " neo, the heat whereof would not force up any groſſer ſubſtance, that might be " contained in it: whereupon, the diſtilled water was found to be exactly of the " ſame weight with the water before diſtillation, not differing ¼ of a grain in 1122 " grains, which was the weight of what the vial before mentioned did contain. " This ſhould infer this conduit-water to be of a purer ſort (being as light as " itſelf diſtilled) and to contain nothing earthy or ſaline in it.

" For ſpirit of wine, there were taken two ſorts, rectified ſeveral times: the " lighter was in proportion to water as 1 ℥. 19 ʒ. 8 gr. to 2 6 18, or as 944 gr. " to 1122, which was the full quantity weighed of both: the heavier was to the " water as 1 ℥. 1 ʒ. 2 gr. to 2 6 18, or as 986 grains to 1122; or becauſe theſe " numbers are capable of bipartition, it may be expreſſed more conveniently, " that the former ſpirit was to the water as 472, and the latter as 493 to 561. " The former of theſe ſpirits was of that ſtrength, that a ſpoonful in a ſmall ſilver " cup did burn all away, and the latter left about $\frac{1}{16}$ part of phlegm, and this was " hotter than one could endure to drink.

" Of each ſort of theſe ſpirits was put into a ſmall vial, capable of more than " double the quantity, ſomewhat above an ounce; that is to ſay, 1 ℥. 20¼ gr. of " the former, and 1 ℥. 12½ gr. of the later; for to bring both to the ſame exact " weight would have been difficult, and have occaſioned ſo much pouring to " and fro, as to have impaired the ſpirits: and withal, in a third vial was put " 1 ℥. 1½ gr. of water: All theſe three were put together under a glaſs body ce- " mented to the engine, and the air exhauſted: upon the working, the ſpirits ſoon " began to boil, and bubbles to ariſe; the lighter firſt, and larger with bubbles; " both at a greater rate than is uſual in warm water, while in the mean time " the water could not be diſcerned to boil at all, or any bubble to ariſe in it: " ſome of the bubbles were ſo large, as to make cells in the vials and partitions " tranſverſe through the whole.

" After ſtanding twenty-four hours (the engine in the mean time having been " wrought ſeveral times) the vials were taken out. The lighter ſpirit of wine had " loſt in weight 1 ʒ. 9¾ gr. the other 1 ʒ. 6¼ gr. ſo that the diminution in the for" mer was as 33¾ out of 500¼; in the later 30¼ out of 492¼.

" The water, upon exact weighing, had gained 2¾ gr. which might give cauſe " to ſuſpect there had been ſome miſtake in the weight of it before; but one par" ticular may ſalve the matter, for it had clearly gotten a ſcent and taſte of the " ſpirit of wine, as if ſome of the ſpirits diſſipated through the glaſs body had " embodied themſelves within the water.

" There were ſet, for the ſame ſpace of time, of the two ſpirits and water afore" ſaid, three parcels, of the ſame weight as before; that is to ſay, of the firſt " ſpirit 1 ℥. 22¼ gr. or 502¼ gr. and of the other, as it happened, juſt the ſame " quantity; of the water 1 ℥. 11 gr. or 491 gr. in the like vials with their " mouths open, in the open air: the firſt ſpirit loſt in weight only 1¾ gr. the ſe" cond 2 gr. and the water to be ſure did not get, but loſt, according to the ex" acteſt weighing, that could be made, ¾ of a grain."

Sir Robert Moray's relation concerning diving and working under water, received by him from Mr. Maule, was read; together with an account of an inſtrument, with which the ſaid Mr. Maule could take ballaſt out of a ſhip lying 15, 20, or 25 fathoms under water: both which papers were ordered to be regiſtered[*], as follows:

" A bell of lead of about 2½ foot deep, and as wide at bottom, was uſed for " ſerving of air under-water.

" There was a rope faſtened a-croſs the bell, upon which the perſon ſat, that " dived in it.

" He himſelf hath been under water 15 or 16 fathom, and ſtayed there half " an hour.

" Others have been 20 or 24 fathom, and above, and ſtayed as long.

" Some are much abler to ſtay under water than others; for ſome have bled at " noſe and ears under that depth, others not; and they, who do ſo at firſt, will be " the more able to endure it at the ſecond or third trial.

" When there was any work to be done, that was of long duration, he had two " or three men, who relieved one another.

" They were not naked when they dived, but having firſt anointed their bodies " with train-oil, they put on trowſers, and a cloſe waiſtcoat of flannel, which were

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[*] Original Regiſter, vol. iii. p. 20.

“ dried at a fire in the boat, by which the bell was hung in the water, to be ready “ for the next turn.

“ His men never went out of the bell.

“ When the bell is let down into the depth of 16 fathoms, and the divers have “ continued there ſome half an hour or more, very ordinarily they ſwoon or fall “ in a ſleep, they know not how; ſo that upon notice thereof, they being drawn “ up, do not recover, but by holding them by the noſtrils; and then wonder how “ they came to be ſo drowſy.

“ The decks of ſhips, planks, and ſtones under water, are ſo ſlippery, that it “ is hard to walk on them without falling; eſpecially when they lie a-ſlope, as all “ decks of ſhips do under water.

“ The bells are to have ſkores drawn in them from top to brim, that the dew “ proceeding from the breath may the more eaſily diſtil in them.

“ If the diver do fan his face in the bell, when it is ſunk deep, with a fan or “ wooden trencher, it will much refreſh him.

“ The air in the bell grows very hot and ſtifling, after having breathed in it “ half an hour or ſo, when it is 10 fathom deep or more.

“ When the air in the bell is warm, ſo much of the body as is within it is warm, “ and the reſt cold; but the train oil preſerves the cold in ſome meaſure.

“ Mr. **Maule** hath an inſtrument, with which he can take ballaſt out of ſhips “ lying under water at 15, 20, or 25 fathom deep.

“ This engine is ſo framed, that when it is let down to the depth required, it “ hath an arm, that by a pulley is ſtretched out to a great length; and having an “ iron hoop, with a bag or net faſtened to it, doth drag out the ballaſt, and throw “ it into the ſea.

“ He hath alſo another engine, to widen the open places of the deck of a ſhip “ under water, if need be, for making room for a gun or other thing to be taken “ out of the ſhip's hold, at great depths under water. It is a ſaw, which letteth “ down through long bored pieces of timber by the pumps, making them move “ up and down by ropes and pulleys; and hath a rope tied to the ſaw, the end “ whereof is held by a man or two in a boat at 150 or 200 fathom diſtance to “ pull the ſaw, ſo as to make it bear upon the timber, as is fit.

“ He hath often attempted to ſink empty barrels 18 or 20 fathom under water, “ having a device like the engine for taking up ballaſt, to thruſt and place them “ under the decks of the ſhip, thinking thereby to buoy up ſunk ſhips; but never “ could get the barrels to go down whole, for the preſſure of the water conſtantly

" cruſhed them to pieces, before they could be ſunk to the depth required: and " having ſtrengthened the barrels with iron bars and hoops within, ſo that it was " much harder to break them inwards than outwards; yet in deſpite of all he " could do, they were always cruſhed as before.

" He affirms, that an expert diver can ſtay under water a long while, without " any other help for reſpiration than a piece of ſponge dipt in oil, which he holds " in his mouth, having his noſtrils ſtopt; believing, that by means of the oiled " ſponge he can ſuck air enough out of the water to ſerve him for divers reſpira- " tions."

Mr. Colwall's account of frauds committed about hides and leathers, expreſſed in the ſtatutes, was read, and ordered to be communicated to Mr. Charles Howard, in reference to his hiſtory of tanning.

Mr. Boyle produced a ſubſtance found in ambergriſe, ſaid by ſome to be the beaks of birds. He was deſired to examine it chemically, to ſee whether it be an animal ſubſtance or not.

The buſineſs of diving being again ſpoken of, Dr. Charleton made mention of one Mr. Knipe, as able to give a good account of the diving for the Coco-Maldiva. He was deſired to procure that account in writing; which he promiſed to do when Mr. Knipe ſhould come to town.

Mr. Boyle gave the Society ſome account of Monſ. Pascal's lately publiſhed treatiſe of the weight of the air, and promiſed to give a larger account hereafter.

He likewiſe ſhewed ſome experiments mentioned in that book, and was deſired to give them in writing; and to add, at his firſt convenience, the experiment concerning the manner of the aſcenſion of water in pumps: in order to which, the operator was ordered to draw three or four of the glaſs-pipes, employed by Mr. Boyle, for the ſhewing of this experiment.

The operator gave an account of the experiment of the condition of the bird in the air compreſſed to a third; *viz.* that it was ſomewhat ſick whilſt incloſed in the veſſel, wherein the ſaid compreſſion was made; but being taken out, was found well and lively, though afterwards ſick again; yet died not, as the other did in a former experiment, but rcovered perfectly.

The experiment of breaking ſeveral ſorts of wood was begun to be made; and there were taken three pieces of ſeveral kinds of fir, oak, and aſh; each an inch thick, and two foot long: the fir, weighing $8\frac{1}{16}$ ounces, was broken with two hundred weight; the oak, weighing $12\frac{1}{4}$ ounces, broken with two hundred and a half weight; and the aſh, weighing $10\frac{1}{4}$ ounces, was broken with three hundred twenty-five pounds weight.

Beſides, there were taken three pieces of the ſame ſorts of wood, each half an inch thick, and a foot long. The fir weighed one ounce, and was broken with $\frac{3}{8}$ of an hundred. The oak weighed 1$\frac{1}{8}$ ounce, and was broken with $\frac{3}{8}$ of an hundred: and the aſh weighed 1$\frac{3}{8}$ ounce, and was broken with an hundred pounds.

Again, there was a piece of fir half an inch ſquare, and two feet long, broken with thirty-three pounds. A piece of half an inch thick, an inch broad, and two feet long, broken with an hundred weight edgewiſe: and a piece of half an inch thick, an inch and an half broad, and two feet long, broken with an hundred and twenty-five pounds weight edgewiſe.

This experiment was ordered to be proſecuted by the lord viſcount BROUNCKER, Sir WILLIAM PETTY, and Mr. HOOKE; and it was ſuggeſted by ſome of the members, that in theſe trials conſideration might be had of the age, knottineſs, ſolidity, different ſoils, and ſeveral parts of trees; and an account brought in writing of the whole.

Sir ROBERT MORAY particularly moved, that it might be obſerved, how far any kind of wood bends before it breaks.

Mention being made of the ſtandard how to eſtimate highly rectified ſpirit of wine by, Sir WILLIAM PETTY ſuggeſted, that it might be eſtimated by its burning away quicker by wicks, the ordinary ſtandard being its burning away by flame.

Mr. OLDENBURG, the ſecretary, gave ſome account from Mr. BEAL concerning the ſpirit of cider, *viz.* that one Mr. GULSON, a candid and able artiſt in Somerſetſhire, had diſtilled ſome cider made of promiſcous cider-fruit, and obtained one full pint of very good ſpirit out of four quarts of ſuch cider; but had not expreſſed, whether he had employed old or new cider.

Sir PAUL NEILE related, that he had been informed, that Sir EDMUND SAWYER had obtained double the quantity of ſpirit from cider made of the Bramſbury and Fillet to that of pippins.

Mr. BOYLE related from a credible perſon in Ruſſia, that in thoſe parts there had lately appeared a comet, and that there had been felt a conſiderable earthquake, a thing unuſual in that country.

Dr. CROUNE promiſed to write to Dr. POWER about Mr. GASCOYNE's papers concerning glaſſes.

Mr. BEAL having offered by letter to communicate ſeveral obſervations on agriculture, if the ſociety ſhould pleaſe to appoint a committee to receive and examine them; it was thought good, that the council ſhould conſider of this and other committees for ſeveral ſubjects; and having appointed them, and nominated fit perſons for them, preſent them to the ſociety for their approbation or alteration.

Sir ROBERT MORAY mentioned, that Monſieur LE SON, then in England, pretended ſo to compreſs the air, as to make it burn wood.

1664. *March* 30. At the meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER,
preſident.
Mr. HOWARD.
Sir ROBERT MORAY.
Sir PAUL NEILE.
Sir ANTHONY MORGAN.
Sir PETER WYCHE.

Dr. WILKINS.
Dr. GODDARD.
Dr. MERRET.
Mr. BALLE.
Mr. PALMER.
Mr. COLWALL.
Mr. OLDENBURG.

A draught of eight committees for the conſideration of ſeveral ſubjects belonging to the cognizance of the ſociety was read, and ordered to be offered to the ſociety at their meeting this afternoon for their approbation.

The following order of council was made,

> " When any three or more of the council (the preſident and one of the ſecretaries being two of the number) are met at the time and place appointed for any meeting thereof, they are deſired to examine, conſider, debate, and prepare any buſineſs or matter appointed to be conſidered or done by the council, and report what is by them agreed upon to the ſame, and to give directions for making and preparing experiments."

It being propoſed to Mr. MARTYN, the ſociety's printer, whether he would be at the charge of the tranſlation and printing of the aſtronomical manuſcript of ULUG BEIG, he was deſired to ſend his anſwer within two or three days to Dr. WILKINS, to be by him ſignified to rhe preſident.

Sir ROBERT MORAY and Sir PAUL NEILE were deſired to get from the attorney general the paper declaring, that it is in his majeſty's power to diſpoſe of Chelſea-College, and to refer the ſame, together with the charter of the ſaid college, to the conſideration of Sir ANTHONY MOROAN.

Dr. MERRET propoſing a perſon fit to be entertained by the ſociety as an aſſiſtant to the operator, and as a collector of the curioſities of England, as to plants, birds, and fiſh, he was deſired to addreſs him to Dr. WILKINS and Dr. GODDARD for farther examination of his fitneſs for ſuch ſervices.

It was ordered, that the ſociety's tube be lent to Mr. MOXON to make obſervations with.

At the meeting of the Society on the ſame day,

Monſieur John Hevelius, conſul of the city of Dantzic, was propoſed for candidate by Sir Robert Moray; and, becauſe a ſtranger of eminent worth, choſen the ſame day.

The ſecretary was ordered to give him notice hereof in the letter appointed March 9 preceding to be written to him.

Dr. Charleton acquainted the ſociety, that one Mr. Klee, an apothecary, was attending without, able to teſtify what he had formerly related concerning the monſter taken out of a woman, like a great fat gooſe, with two human feet, very miſ-ſhapen. He was again deſired to bring in writing the relation of all the particulars thereof, atteſted by himſelf, Mr. Klee, and others, who had ſeen it. Mr. Hooke was ordered to draw the picture of it, according to Dr. Charleton's directions.

Mr. Hooke gave an account of the experiment of compreſſing the air to a quarter, with a little bird in the engine; which having continued therein from eleven in the morning till ten at night ſomewhat panting, was then taken out, and grew lively enough, yet ſickned next day, but was ſoon well again, and remained alive at this day.

It was ordered, that becauſe in the former experiment of this kind, the bird died, and the cauſe thereof was by ſome ſuſpected to be the ſmell of the cement, trial ſhould be made, whether it were ſo or not, by putting one bird into a glaſs with common air, cloſed with clay, and another into the compreſſing engine, with common air likewiſe, but cloſed with cement, to ſee, which of theſe two birds would do beſt, and live longeſt.

Mr. Boyle preſented his *Experiments and conſiderations touching colours* [f].

Sir Charles Berkley [g] was permitted to be preſent at this meeting upon the motion of Dr. Wilkins.

The preſident produced two letters of Dr. Wallis concerning the tranſlation and printing of the aſtronomical inſtitutions of Ulug Beig; and acquainted the ſociety, that in caſe their printer would be at the charge of the tranſlation thereof, it would be proper to have it printed; and that the printer had notice given him of it by the council, who expected an anſwer within a ſhort time.

Sir Robert Moray produced a letter ſent him out of Scotland by the lord Reay, concerning a ſhining rock in an iſland of Scotland, diſcernible in the night-time, which was ſeen in his father's days, but ſaid by the inhabitants of that place not to have been ſeen for above twenty years paſt; but only, that ſometimes after a ſtorm (a ſudden calm enſuing) they diſcerned a brightneſs under the water. Sir ROBERT MORAY was deſired to preſs a farther inquiry into this fact.

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[f] Printed at London 1663, in 8vo. and reprinted there in 1670.

[g] Eldeſt ſon of George lord Berkley, created knight of the Bath at the coronation of king Charles II.

The operator gave an account of more pieces of wood broken by weight, *viz.* 1. Of a piece of fir, four feet long, two inches ſquare, fifty-three ounces weight, broken with 800 lb. weight, and very little bending with 750 lb. Whereby the hypotheſis ſeems to be confirmed, that in ſimilar pieces, the proportion of the breaking weight is according to the baſis of the wood broken. 2. Of a piece of fir two feet long, one inch ſquare, cut away from the middle both ways to half an inch, which indured 250 lb. weight before it broke, which is more by 50 lb. than a piece of the ſame thickneſs every way was formerly broken with. This difference was gueſſed to be in the greater firmneſs of this than that of the other piece.

The preſident was deſired to contribute to the proſecution of this experiment, and particularly to conſider what line a beam muſt be cut in, and how thick it muſt be at the end, to be equally ſtrong.

Mr. BOYLE was put in mind of the experiment, which he promiſed at the preceding meeting, to ſhew the aſcent of water by ſyphons; and the operator was ordered to have ready the glaſſes appointed for it againſt the next meeting.

Sir ROBERT MORAY took occaſion to ſpeak of the proportion of the lateral to the perpendicular preſſure of water, deſiring, that Mr. BOYLE might conſider that ſubject.

The preſident was deſired to conſider the *aquæ ſalientes*.

The experiment of compreſſing water in a copper ball was tried, but ſucceeded not, the veſſel leaking upon the making a dent in it. It was ordered to be repeated at the next meeting, and the veſſel to be made fitter for trial.

Mr. HOOKE was ordered to make at the next meeting the experiment to prove, that glaſs will ſtretch.

An experiment was made in a bolt-head with a long ſmall ſtem filled with cold water, and then put into warm water; whereupon it ſunk to half an inch, whereas otherwiſe it riſes by warmth. The cauſe of this ſinking was by ſome aſcribed to the ſtretching of the glaſs by warmth. It was ordered to be repeated at the next meeting.

A liſt

A liſt of the ſeveral committees of the ſociety.

1. Mechanical.

To conſider and improve all mechanical inventions.

Mr. Aerskine.
The lord Annesley.
Earl of Argyle.
Lord Ashley.
The lord viſ. Brouncker, preſident.
The duke of Buckingham.
The lord Berkeley.
Mr. Robert Boyle.
Mr. Richard Boyle.
Mr. Brereton.
The abbé De Beaufort.
Sir Edward Bysshe.
Sir John Birkenhead.
Dr. Ralph Bathurst.
Mr. Isaac Barrow.
Earl of Craford and Lindesey.
Lord Cavendish.
Marquis of Dorchester.
Earl of Devonshire.
Lord Dungarvan.
Sir John Denham.
Earl of Elgin.
Mr. Evelyn.
Lord biſhop of Exeter.
Sir Francis Fane.
Sir John Finch.
Dr. Goddard.
Lord Hatton.
Sir Robert Harley.
Sir Edward Harley.
Mr. Hooke.
Mr. Jones.
Sir Andrew King.
Lord Lucas.
Sir Ellis Leighton.
Sir John Lowther.
Col. Long.
Lord Massareene.
Sir Robert Moray.
Sir Anthony Morgan.
Earl of Northampton.
Sir Paul Neile.
Sir Thomas Notte.
Earl of Peterborough.
Sir Robert Paston.
Sir Richard Powle.
Sir William Persall.
Sir William Petty.
Sir Peter Pett.
Mr. Povey.
Commiſſioner Pett.
Dr. Pell.
Dr. Pope.
Earl of Sandwich.
Sir James Shaen.
Mr. Southwell.
Earl of Tweedale.
Sir Gilbert Talbot.
Sir John Talbot.
Col. Tuke.
Mr. Matthew Wren.
Mr. Winthrop.
Dr. Wilkins.
Dr. Wallis.
Dr. Wren.
Mr. Williams.
Sir Peter Wyche.
Sir Cyrill Wyche.
Monſ. De Zuylichem.

2. Aſtronomical and Optical.

Lord Brouncker, preſid.
Mr. Boyle.
Mr. Balle.
Mr. Barrow.
Lord biſhop of Exeter.
Monſieur Hevelius.
Mr. Hooke.
Sir Robert Moray.
Sir Paul Neile.
Mr. Neile.
Mr. Palmer.
Dr. Pell.
Dr. Wallis.
Dr. Christopher Wren.
Monſieur Zuylichem.

3. Anatomical.

Mr. Boyle.
Mr. Hooke.
Dr. Wilkins.
All the phyſicians of the ſociety.

4. Chemical.

Duke of Buckingham.
Mr. Boyle.
Sir Kenelm Digby.
Mr. Charles Howard.
Mr. Henshaw.
Monſieur Le Febure.
Sir Robert Paston.
All the phyſicians of the ſociety.

5. Georgical.

Lord Ashley.
Mr. Austin.
Mr. Aubrey.
Mr. Boyle.
Mr. Brereton.
Mr. Balle.
Mr. Beal.
Earl of Craford and Lindesey.
Dr. Cotton.
Mr. Colwall.
Mr. Evelyn.
Mr. Ford.
Dr. Goddard.
Sir Edward Harley.
Mr. Henshaw.
Mr. Howard.
Dr. Holder.
Mr. Hill.
Mr. Hoskins.
Mr. Long.
Dr. Merret.
Sir Robert Moray.
Mr. Oldenburg.
Mr. Packer.
Mr. Povey.
Dr. Smith.
Mr. Edward Smith.
Sir John Talbot.
Mr. Waller.
Mr. Waterhouse.
Dr. Wilkins.
Mr. Matthew Wren.

6. For Hiſtories of Trade.

Mr. Beal.
Mr. Robert Boyle.
Mr. Colwall.
Dr. Cotton.
Mr. Creed.
Dr. Croune.
Mr. Ellise.
Mr. Evelyn.
Mr. Gomeldon.
Mr. Graunt.
Mr. Hayes.
Mr. Henshaw.
Mr. Hill.
Mr. Hoskyns.
Mr. Hooke.
Mr. Howard.
Mr. Lowther.
Dr. Merret.
Sir Robert Moray.
Sir William Petty.
Mr. Potter.
Mr. Henry Powle.
Mr. Proby.
Mr. Schroter.
Mr. Slingesby.
Mr. Southwell.
Mr. Stanhope.
Mr. Stanley.
Mr. Vermuyden:
Dr. Wilkins.
Mr. Williams.
Mr. Willughby:
Mr. Winde.
Mr. Winthrop.
Mr. Wylde.

7. For collecting all the phænomena of nature hitherto obſerved, and all experiments made and recorded.

Mr. Ashmole.
Mr. Balle.
Mr. Barrow.
Dr. Bathurst.
Mr. Beal.
Mr. Burnet.
Mr. Carkess.
Dr. Charleton.
Mr. Clayton.
Mr. Coxe.
Mr. Dryden.
Dr. Glisson.
Mr. Henshaw.
Mr. Hooke.
Mr. Hoskyns.
Dr. Merret.
Mr. Neile.
Dr. Pell.
Mr. Sprat.
Dr. Wallis.
Dr. Christopher Wren.

8. For Correſpondence.

Mr. Aerskine.
Dr. Balle.
Mr. Beal.
Mr. Boyle.
Mr. Clayton.
Mr. Colwall.
Mr. Creed.
Sir Kenelme Digby.
Mr. Haak.
Mr. Hill.
Sir Robert Moray.
Mr. Oldenburg.
Mr. Povey.
Monſieur Sorbiere.
Col. Tuke.
Dr. Wilkins.
Mr. Williamson.
Mr. Matthew Wren.
Sir Peter Wyche.
Sir Cyril Wyche.

April 6. At a meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER, preſident.
Sir ROBERT MORAY.
Sir ANTHONY MORGAN.
Mr. AERSKINE.
Sir PETER WYCHE.
Mr. BALLE.
Mr. PALMER.
Dr. GODDARD.
Mr. WHISTLER.
Mr. HILL.
Mr. COLWALL.
Mr. OLDENBURG.

It was ordered, that Mr. PALMER be added to the Monday's committee for preparing experiments to entertain his majeſty.

It was likewiſe ordered, that the ſecretary draw up a form of a diploma teſtifying ſtrangers to have elected into the ſociety.

The following draught of a ſtatute diſpenſing with foreigners elected into the ſociety, as to their ſubſcription and admiſſion, was read, and paſſed the firſt time :

" When any perſon reſiding in remote or foreign parts ſhall be elected into the
" ſociety in the due and accuſtomed form and manner, the ſaid perſon ſhall be
" regiſtered among the fellows of the ſociety, and be reputed a fellow thereof,
" without ſubſcription and admiſſion in the uſual form, any thing contained in the
" ſtatutes, requiring ſubſcription and admiſſion, to the contrary notwithſtanding.
" And the ſaid perſon may have an inſtrument under the ſeal of the ſociety, teſti-
" fying him to be elected and reputed a fellow of the ſociety accordingly."

The Preſident, Sir ROBERT MORAY, and Dr. WILKINS, were deſired to viſit the ground belonging to Chelſea College, and to obſerve how it lies.

It was ordered, that Dr. WILKINS deſire the biſhop of Exeter to inquire, what the dean of St. Paul's[b] pretended with reſpect to that college: And

That the ſecretary deſire Mr. BOYLE to inform himſelf by the lord privy ſeal, why the king's grant of that college to Mr. SUTCLIFFE was ſtopped? and what his lordſhip judged of the cauſes alledged by the petitioners for ſtopping the ſaid grant? as alſo occaſionally, and by way of diſcourſe, what his lordſhip thought of his majeſty's power of giving away that college, and diſſolving that corporation?

At the meeting of the SOCIETY on the ſame day,

An account was given by Mr. HOOKE of the two birds, that were put, one into a glaſs with common air, cloſed with clay; the other into the compreſſing engine with common air likewiſe, but cloſed with cement, *viz.* that the bird in the glaſs, after it had been kept there eight hours, remained alive and pretty well; but the other bird cloſed up with cement, died within the ſame time. It was deſired, that a way might be thought of to remedy that ſmell, which ſeemed to be the cauſe of the bird's dying in the condenſing engine.

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[b] Dr. JOHN BARWICK.

The experiment of compreſſing water in a copper-ball was repeated, but ſucceeded not, the veſſel leaking again as formerly upon knocking. It was ordered, that the operator ſhould provide againſt the next meeting a leaden ball, holding about two quarts, and conſiſting of two hemiſpheres caſt thick and well poliſhed.

The experiment of ſtretching glaſs was made by Mr. Hooke, who was deſired to give an account of the manner and ſucceſs thereof in writing.

The experiment of making cold common water, put into a bolt-head with a long and ſmall ſtem, ſubſide with warm water, and riſe with cold, was repeated; and Mr. Hooke deſired to bring in an account of it writing.

A letter of Col. Long to Sir Robert Moray was read, acknowledging his philoſophical debts to the ſociety, and giving an account of elms becoming great trees from chips having ſome bark upon them; as alſo from boughs chopt on each ſide, and put into a nurſery of good ground, laying them along in trenches, and covering them with good mould, *&c.* This with the reſt was ordered to be communicated to Mr. Evelyn, and Sir Robert Moray was deſired to give Col. Long the thanks of the ſociety for theſe communications, which came accompanied with ſome rare ſtones with ſcrews in them; as alſo with a ſtone taken out of an ox's gall, but broken, affirmed in the preſenter's letter to have been as big as a Seville-orange of a middle ſize; weighing an ounce and half, and ſmelling like muſk.

Sir Robert Moray related from one Mr. Robinson, that at Leghorn there were ſold upon the market-place pieces of a certain rock, which being broken, were found to contain live and eatable muſcles in them. Dr. Balle was deſired to write to his brother, then in Leghorn, for farther information concerning this ſtory.

Sir Robert Moray mentioned from the ſame Mr. Robinson a ſubſtance of rock-ſalt, having a bubble in it, which, what way ſoever the body be turned, will be on the top. He was deſired to procure a ſight of this piece for the ſociety from Mr. Robinson.

Dr. Charleton remarked, that there were ſome knowing perſons, who would maintain, that images are erected in the retina; and that, notwithſtanding the diverſity of mediums in the eye, there was made but one ſingle refraction. It being urged by him, that thoſe perſons offered to prove their aſſertions by experiments, he undertook to engage them to do ſo.

The experiments of breaking wood were ordered to be proſecuted the next day, and the operator was directed to provide ſome crooked oaken billet, and to cut two ſtrait pieces out of the middle thereof, wherein the grain will run arching, in order to conſider the grain of the wood.

April 13. At a meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER,
  preſident.
Mr. HOWARD.
Sir ROBERT MORAY.
Sir ANTHONY MORGAN.
Mr. AERSKINE.
Sir PETER WYCHE.
Mr. BALLE.
Dr. GODDARD.
Dr. WHISTLER.
Mr. PALMER.
Mr. HILL.
Mr. OLDENBURG.

It was debated, whether the manuſcript of ULUG BEIG ſhould be printed by another, if MARTYN and ALLESTRY, the ſociety's printers, would not do it? But it was not fully reſolved upon by reaſon of the non-attendance of thoſe two perſons, who had been appointed to be preſent this day. It was ordered, that they ſhould have notice to attend the council at the next meeting.

The ſtatute diſpenſing with foreigners elected into the ſociety for their ſubſcription and admiſſion was read again, and paſſed the ſecond time with ſome ſmall alteration, as follows:

" When any perſon reſiding in foreign parts ſhall be elected into the ſociety
" in due and accuſtomed form and manner, the ſaid perſon ſhall be regiſtered
" among the fellows of the ſociety, and be reputed a fellow thereof, without ſub-
" ſcription or admiſſion in the uſual form; any thing contained in the ſtatutes, re-
" quiring ſubſcription and admiſſion, to the contrary notwithſtanding. And the
" ſaid perſon may have an inſtrument under the ſeal of the ſociety, teſtifying him
" to be elected and reputed a fellow of the ſociety accordingly."

The ſecretary offered a draught of ſuch a diploma, as is mentioned in the abovementioned ſtatute, with relation to Monſieur HEVELIUS; and it was read, and approved with ſome alterations, as follows:

Præſes, concilium, & ſodales Regales Societatis Londini pro ſcientiâ naturali promovendâ, omnibus & ſingulis, ad quos præſentes pervenerint, ſalutem. Cum virtute & ſcientiis mathematicis, præcipuè verò laboribus & ſcriptis aſtronomicis illuſtris dominus JOHANNES HEVELIUS, *celeberrimæ civitatis Gedanenſis conſul ampliſſimus, ſingularem ſuum in dictæ Societatis conatus & ſtudia affectum humaniſſimis literis uberrimè fuerit teſtatus, ſuiſque meritis egregiis rem litterarium & ſolidam imprimis philoſophiam augere & ornare pro virili ſatagat; dicta Societatas laudatum dominum Hevelium die 30 Martii anni 1664, in ſolenni conſeſſu, conſpirantibus omnium ſuffragiis, in ſodalium ſuorum album cooptavit, inque hujus rei teſtimonium ſigillum ſuum præſentibus affigi curavit. Dat. Londini anno æræ Chriſtianæ 1664, regni* CAROLI II. *auguſtiſſimi Magnæ Britanniæ, &c. regis, dictæ Societatis fundatoris & patroni munificentiſſimi, decimo ſexto.*

At the meeting of the SOCIETY on the ſame day,

The experiment of compreſſing water in a leaden ball was tried by weighing the leaden ball, filled with water, in water, and then taking it out, and knocking dents into, and ſo weighing it again in water, to ſee, whether it weighed any thing more than it did before it was knockt. But the difference of the weight was ſo imperceptible, that the ſcale ſeemed not ſo much as to turn, although the dents were conſiderable; but there appeared ſome compreſſion in the water by its ſpirting out, when the ball was bored through.

Mr. HOOKE mentioned, that he had another way of compreſſing water, which he was ordered to prepare for the next meeting.

Mr. BOYLE likewiſe took notice of an experiment of compreſſing water to be made ſome weeks after.

Mr. HOOKE affirmed, that water in a trial of his would not compreſs ſenſibly with that force, which would compreſs the air into the 11th or 12th part.

An account in writing was brought in by Mr. HOOKE of two experiments tried before the ſociety at the preceding meeting. 1. Of the raiſing of water in a bolthead upon immerſion in cold, and falling upon the immerſion of it in hot water. 2. Of the ſtretching and ſhrinking of glaſs upon heating and cooling: both which were ordered to be regiſtered[1], as follow:

" There was taken a large bolt head, containing about two quarts, which was " filled with water till it roſe about a foot in the ſtem (which was ſmall) then the " ſtation of the water being marked, it was immerſed in warm water, whereupon " the water in the ſlender ſtem fell about half an inch; but upon continuing in " that warm liquor, it by degrees re-aſcended, and ſurmounted its former height.

" Afterwards, while yet pretty warm, it was immerſed in cold water; where" upon the water roſe about a quarter of an inch, but upon a longer ſtay in that " medium, it fell again to that place from which it had aſcended, and afterwards " below it.

" The reaſons of which phænomena ſeem deducible from the ſtretching and " ſhrinking of the glaſs upon the ſudden acceſs of heat and cold, before theſe qua" lities can alike affect the included water.

" To prove the ſtretching and ſhrinking of glaſs upon heating and cooling, " there were made theſe trials.

" There was taken a hollow cylinder of glaſs, about a ſpan long, ſharpned " and ſealed up at both ends. This was fitted between the centers of a turning" lathe, ſo that it would be very eaſily moved and turned round whilſt cold, but " upon the heating the middle of this glaſs with the flame of a candle, it ſtretched " ſo far in length, that it could not without much difficulty be turned round: but " afterwards upon cooling, it ſhortned and returned to its former laxity, being as " eaſy to be moved as before.

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[1] Original Regiſter, vol. iii. p. 23.

"Becauſe it was objected, that poſſibly the rarefaction of the included air might "be the cauſe of this ſtretching, the ſame experiment with the ſame ſucceſs was "tried with the ſame cylinder opened at one end, ſo that the air had a free paſſage "to and fro."

Sir ROBERT MORAY, Mr. SLINGESBY, Dr. GOODARD, and Mr. HOOKE were appointed curators for the weighing of all ſorts of bodies.

Dr. WALLIS's two letters, written to Mr. OLDENBURG from Oxford, April 6 and 7, 1664, were read; wherein the doctor gives an account of the buſineſſes committed to his care by the ſociety about the catalogue of the fixed ſtars written by ULUG BEIG, and the tranſlating and printing of the whole manuſcript of the ſaid ULUG BEIG; as alſo of his and Dr. WREN's judgment concerning three manuſcripts of Mr. HORROX for the reſtitution of aſtronomy.

The doctor in his letter of the 6th of April* obſerves, that upon his return to Oxford he ſpoke with Mr. THO. HYDE, as he had been deſired by the ſociety, concerning the tranſlating and printing ULUG BEIG in Latin, to know, whether Mr. HYDE was willing, and upon what terms, to undertake it. Mr. HYDE anſwered, that as to the part concerning the fixt ſtars, which he had already tranſlated, he was willing to take the care of the impreſſion *gratis*, if the ſociety's printer would undertake the charge thereof, provided it was printed at Oxford; becauſe otherwiſe he could not attend the preſs by reaſon of his attendance on the Bodleian library. For the reſt of the work, if the ſociety deſired it, he would be willing to ſerve them in tranſlating and taking care of the impreſſion in like manner, and would refer himſelf to them to gratify him for his pains as they ſhould think fit: but being preſſed farther to make a particular propoſal (according to the ſociety's inſtructions to Dr. WALLIS) he thought that he might deſerve twenty or thirty pounds, and ſome copies for preſents to his friends: but if the ſociety ſhould think that too much, he would be ready to ſerve them, and refer himſelf abſolutely to their pleaſure. He added, that he was willing, if he ſhould undertake it, to go in hand with it as ſoon as might be, becauſe he knew not how ſoon he might be otherwiſe diverted; and if it ſhould be agreed upon, he would put to the preſs the part already done, that it might be printed, while the reſt was tranſlating. Dr. WALLIS declared it to be his opinion, that Mr. HYDE well deſerved the reward, if the ſociety's ſtock could ſpare the money, conſidering, that he muſt not only tranſlate, but likewiſe tranſcribe the whole Perſian copy for the preſs, and then (which was not the leaſt part of the taſk) attend and correct the preſs all the while; which in a book of that bulk (for it would make a large quarto) and in ſuch a language, he would find a troubleſome work; though it was probable, that he rather looked upon the credit of it than the ſum propoſed as the reward. In the mean time Dr WALLIS had tranſcribed that part of it which contained the catalogue of the fixed ſtars out of Mr. HYDE's tranſlation, which the doctor had before compared, as to numbers, with the three Perſion books very accurately. And he did this the rather himſelf, that he might be the better ſatisfied of the exact agreement of the numbers with the original, which was of great importance in a work of that nature, and very ſubject to miſtake by a common tranſcriber. This tranſcript, with a letter to HEVELIUS in anſwer to one from the latter to him, was incloſed in the doctor's letter to Mr. OLDENBURG, in order that it might be immediately tranſmitted to HEVELIUS, who would, the doctor preſumed, be willing to ſee it ſooner than the impreſſion could be expected. As to the pieces of Mr. HORROX, which Dr. WALLIS had been deſired to peruſe for the ſatisfaction of the ſociety, whether they were proper to be printed, he had accordingly read them himſelf, and likewiſe deſired his collegue Dr. CHRISTOPHER WREN to do the ſame; and their joint opinion was, that as to the Engliſh piece, it would not be fit for publication, becauſe it contained only broken incoherent things, ſet down by the author only for his memory, as they came into his mind, and brought for the moſt part into the Latin in their proper places, and ſometimes with retractations and alterations upon ſecond thoughts of what he had at firſt ſet down in the Engliſh. But they looked upon the Latin pieces as the beginning and attempt of an excellent work for the reſtitution of aſtronomy, and which ſerved to ſhew, how great a loſs it was, that Mr. HORROX died ſo ſoon, ſince it appeared from this and that concerning his obſervation of Venus ſeen in the ſun, already printed[l], both of them compoſed by him when he was young, with how much diligence and ſagacity he was likely to have applied himſelf to thoſe ſtudies, if he had lived. And though theſe pieces were very imperfect, and not near finiſhed, yet they contained the hints of very good things, which deſerved to be preſerved. It might indeed ſeem needleſs to confute LANSBERG[m], and perhaps unſeaſonable, when the world was already ſatisfied, that his tables did not anſwer the commendations, which himſelf gave them. But though this ſeemed to be the direct intention of the title, yet it was the leaſt part of what was intended in Mr. HORROX's work; which undertakes ſo to ſhew LANSBERG's errors, as at the ſame time to ſubſtitute the true hypotheſis and true meaſures from obſervation, inſtead of them. And upon that account, eſpecially if Mr. HORROX's obſervations were likewiſe preſerved, which theſe pieces teſtified to have been made by him in great number and with great care, as well as his tables, which Dr. WREN told Dr. WALLIS he had ſeen in Mr. JONAS MOORE's hands, they might, together with theſe Latin pieces, be printed to very good purpoſes. But it would then be neceſſary, that theſe two Latin pieces be both digeſted ſo, as to be brought into one (for they were only two attempts of the ſame thing) which might eaſily be done by beginning with the prolegomena of the leſſer piece, and then proceeding with the other in order to the beginning of the fifth diſputation; which fifth diſputation (which was the ſame in ſubſtance with what followed in the leſs piece of the prolegomena) might admit of ſome inſertions out of the leſs piece ſo far as it goes. A preface muſt be prefixed by the publiſher, to give an account why the work comes out ſo late, and why ſo imperfect; and the whole muſt be compared with the papers, from which it was tranſcribed; for it was manifeſt from the groſs miſtakes, of which Dr. WALLIS corrected ſome hundreds as he read it, that it was tranſcribed by one, who did not well underſtand either aſtronomy or Latin. The doctor with this account returned to Mr. OLDENBURG the books themſelves, to be reſtored to the ſociety, from whom he had them.

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* Letter-book, vol. i. p. 126.

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[l] By HEVELIUS with his own *Mercurius in ſole viſus.*

[m] PHILIP LANSBERG, of Ghent, whoſe tables of the celeſtial motions was printed at Middleburg in 1632.

Upon reading this letter, it was ordered, that the ſecretary ſhould return Dr. Wallis the thanks of the ſociety for his ſpecial care and great pains taken in theſe particulars; and deſire him in their name, to gratify the learned world with digeſting the Latin pieces of Mr. Horrox in ſuch a manner, as he had adviſed himſelf in his letter of April 6.

The buſineſs of tranſlating and printing Ulug Beig was referred to the conſideration of the council, to fix upon a tranſlator, and to regulate the charges of the whole.

There was alſo read a Latin letter of Dr. Wallis to Mr. Hevelius, dated March 30, 1664, wherein he gives the latter notice, 1. Of his ſending him the written catalogue of the fixt ſtars by Ulug Beig, tranſlated by himſelf out of the original of the interpreter Mr. Hyde, and likewiſe examined and corrected by himſelf according to the numbers of three Perſian MSS. found at Oxford. 2. Of ſome obſervations concerning the *Stella Ceti*, firſt obſerved by Mr. John Palmer. 3. Of the conſtitution of the Royal Society, according to the deſire of Mr. Hevelius. It was ordered, that the amanuenſis ſhould make a copy of this letter, to be entered into the Letter-book of the ſociety[*].

Mr. Winde was deſired to ſpeak to Mr. Jonas Moore concerning Mr. Horrox's aſtronomical tables, and to procure them from him for the uſe of the ſociety and the public.

There was made an obſervation concerning the proportion of the weight of lead to that of water; of which Mr. Hooke was ordered to bring in an account in writing at the next day.

The experiments appointed for the next meeting, beſides the above-mentioned concerning the compreſſion of water, were as follow: 1. The proſecution of the of breaking ſeveral ſorts of wood by weight, and particularly of cutting two ſtrait pieces out of the middle of ſome oaken billet, wherein the grain will run arching. 2. The Magdeburg experiment with two bottles opening into one another, one containing water, the other air only, to be exhauſted.

Mention was made by Mr. Hooke, that a way might be conſidered of petrifying wood: of ſoftening wood for eaſy carving, and then hardening it again; and of hardening wood, and making it laſting by boiling it in tar. The diſcourſe of theſe particulars was referred to the next meeting.

April 20. At a meeting of the Council were preſent

The lord viſcount Brouncker, preſident.
Mr. Howard.
Sir Robert Moray.
Sir Paul Neile.
Sir Peter Wyche.
Mr. Aerskine.
Dr. Goddard.
Mr. Balle.
Mr. Palmer.
Mr. Colwall.
Mr. Hill.
Mr. Oldenburg.

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[*] Vol. i. p. 131, 132.

It was ordered, that the preſident, Sir **Robert Moray**, and Sir **Paul Neile**, ſhould be empowered to treat with Mr. **Sutcliffe**, concerning his pretenſions to the houſe of Chelſea-college, and to offer him one hundred pounds to quit his ſaid pretenſions; as alſo to treat with Mr. **Cole**, concerning the land belonging to the ſaid college.

It was ordered likewiſe, that the preſident ſhould keep the paper of ſubſcriptions made for Dr. **Charleton** by ſeveral members of the Society for contributing to a recompence for the care and pains, which the doctor was willing to take in anatomical adminiſtrations:

That the Society be moved to appoint Dr. **Charleton** to have the care of diſſecting bodies for one year: And

That the ſecretary do write to Mr. **Hevelius**, and deſire of him, that as the catalogue of the fixed ſtars by **Ulug Beig** was ſent him for his private ſatisfaction, he would not, by printing that catalogue, anticipate the Society's purpoſe of printing the whole book.

At the meeting of the **Society** on the ſame day,

The experiment of breaking wood was proſecuted; and there was taken, firſt, two pieces of fir, each two foot long, and one inch ſquare; which were broken, the one lengthwiſe, with three hundred weight; the other tranſverſe, with two hundred and an half. Secondly, two pieces of the ſame wood, each of three quarters of an inch ſquare, and two foot long, were broken, the one lengthwiſe, with an hundred and a quarter; the other tranſverſe, with an hundred weight. Thirdly, one piece of two foot long, half an inch ſquare, broken lengthwiſe, with forty-one pounds. Fourthly, one piece cut out of a crooked oaken billet, with an arching grain, about three quarters of an inch ſquare, two foot long; broken with three quarters of an hundred.

Mr. **Hooke** ſhewed the experiment of compreſſing ſpirit of wine by a ſmall glaſs-pipe in the manner of a ſpring; which ſo far ſucceeded, that there was a ſenſible compreſſion of the ſpirit. He was ordered to try it at the next meeting with common water tinged.

Mr. **Boyle** ſhewed an experiment with the ſame glaſs, to make a tad-pole live more freely in water, though under as great a preſſure, as ſerved to condenſe the air into a tenth or twelfth part of its place.

Isaac Vossius was propoſed candidate by Dr. **Charleton**, and at the ſame time, becauſe a foreigner, elected and admitted, without obliging him to any payment.

Sir **Robert Moray** produced a great piece of ſal gemmæ, lent him by Mr. **Robinson**, who had had it about thirty years, and got it from a perſon at Naples, who aſſured him, that he had had it in his poſſeſſion above forty years. It had two little bubbles floating in a certain partition, each by itſelf, but both always uppermoſt, however the piece was turned. It was thought by ſome of the Society to be a liquor with ſome air in it.

Dr. CHARLETON mentioned, that Mr. WYLDE had an art of ſoftening ſteel without fire, and hardening it again. He was deſired to ſpeak with Mr. WYLDE about it, to ſee whether he would impart it to the Society.

Dr. CROUNE mentioned the ſame, and that he intended to try it himſelf, promiſing to give an account of the ſucceſs to the Society.

Sir ROBERT MORAY remarked, that Capt. SILAS TAYLOR had mentioned to him a gentleman, who pretended to diſcover ſome muſical errors, generally committed by all modern maſters of muſic, touching the ſcales, and the proportions of notes; and deſired to be heard by ſome members of the Society verſed in muſic. It was ordered thereupon, that the preſident, the earl of SANDWICH, Sir ROBERT MORAY, Sir PAUL NEILE, Mr. BOYLE, Mr. HENSHAW, Mr. BALLE, Dr. PELL, Dr. CROUNE, Dr. BALLE, and Mr. PACKER, be a committe to examine the matter on the Saturday following, about ten o'clock in the morning, at the preſident's lodgings.

Mr. PACKER mentioned, that yew-trees afford in building the beſt wood for ſtrong and long laſting poſts under ground; whereas poſts made of many other kinds of wood will ſoon rot in the earth, unleſs they be ſomewhat burned, as far as they ſtick in the ground.

Dr. CHARLETON propoſed an anatomical adminiſtration to examine Dr. WILLIS's obſervations of the brain, and to fit a ſkeleton, in order to conſider the articulation and motion of the bones. It was ordered, that the operator take care to demand a body; and that in reference to it, the amanuenſis draw up the copy of the warrant for ſuch a demand, and attend the preſident to ſign it.

Dr. CHARLETON moved, that the progreſs of the growth of tadpoles might be obſerved, they proving perfect frogs. Dr. MERRET was deſired to obſerve of it what might be yet obſerved this year.

The experiments appointed for the next meeting were, 1. The Magdeburg experiment. 2. To compreſs water tinged. 3. To boil wood in tar. 4. To ſhew the aſcenſion of water in ſyphons. 5. To proſecute the experiment of breaking wood by weight.

April 27. At the COUNCIL were preſent,

Dr. WILKINS, vice-preſident.
Sir ROBERT MORAY.
Mr. AERSKINE.
Mr. BALLE.
Mr. PALMER.
Dr. GODDARD.
Mr. HILL.
Mr. COLWALL.
Mr. OLDENBURG.

It was ordered,

That Dr. Wilkins, Dr. Goddard, Mr. Balle, Mr. Colwall, and the ſecretary, be a committee to examine the accounts of Mr. Hill the treaſurer, for the laſt quarter, from Chriſtmas to Lady-day.

That the ſecretary write to Mr. Hevelius, and offer him the printing of Ulug Beig, either in Perſian and Latin, or in Latin alone: And

That he write likewiſe to Dr. Wallis, and deſire him to take occaſion of propoſing to Mr. Hyde to print Ulug Beig in Latin only, without adding the Perſian.

A letter of Col. Long to the ſecretary, dated Apr. 13, 1664, was read, wherein he propoſed to ſend up his boxes with inſects and other curioſities of nature, to be put among the reſt of the things, which were preparing for the king's reception: upon which it was ordered, that the ſecretary ſhould thank Col. Long for his reſpects to the Council, and acquaint him, that he ſhould have timely notice of the day, when the king would viſit the Society; and alſo inquire of him, ſince he mentioned ſhells lying over his vitriol-pit, what kind of ſhells they were; how thick and deep they lay; and what varieties of earth there were between the place where the ſhells lay, and the ſurface of the earth.

It was ordered, that the amanuenſis ſhould handſomely write upon parchment the diploma for Mr. Hevelius, and that Mr. Symonds be deſired to attend the Council at their next meeting, for taking off the ſeal, and to have a ſilver box ready to put the ſeal in: And

That Mr. Hooke direct the making of the two-wheeled engine, and the inſtrument for grinding glaſſes; and bring in a deſcription of the inſtrument to make wheels for watches and clocks.

At the meeting of the Society on the ſame day,

The Magdeburg experiment with two glaſs-bottles joined together by a ſtop-cock, whereof the lower was filled with water, the other had nothing but common air in it, was tried, by applying it to the pneumatic engine, and exhauſting the air out of the upper bottle; whereupon the water in the lower bottle, the ſtop-cock being opened, ſpouted up into the upper bottle, abundance of bubbles of air alſo riſing after it into the ſame.

It was ordered, that the ſame experiment be repeated at the next meeting in other poſitions of the glaſſes, ſo that the water be above, and the air below; and that an account of both be brought in by Mr. Hooke.

The experiment of compreſſing water tinged was tried, and ſucceeded, though but to a very ſmall degree of compreſſion: and Mr. Hooke was ordered to give an account of it in writing.

Monſ. LE FEBURE preſented to the Society his book of chemiſtry, tranſlated out of French into Engliſh.

He produced a retort, wherein he affirmed to have volatilized about twenty ounces of ſalt of tartar with a vaſt quantity of diſtilled vinegar and with ſpirit of wine, the proceſs having laſted two years, and the ſhape of grapes appearing in the neck of the retort. He was deſired to give the proceſs of this in writing.

Mr. BERCHINSHA's paper on muſic [*] was read, wherein he gave an account of the *deſiderata* in muſic, and undertook to bring the art of muſic to that perfection, that even thoſe, who could neither ſing nor play, ſhould be able, by his rules, to make good airs, and compoſe two, three, four, or more parts artificially. He was called in, and thanked for his reſpect to the Society, and aſſured, that the committee appointed at the laſt meeting to hear him, and to diſcourſe with him upon this ſubject, ſhould farther conſider of it, and of ways to encourage and promote his deſign and ſtudy.

Dr. CHARLETON was deſired to ſpeak to Mr. WYLDE from the Society, that he would gratify them, by giving them directions how ſteel is to be ſoftened and hardened again without fire.

Mr. HOOKE was put in mind to make the experiment with a bird in compreſſed air, after another manner, at the next meeting.

The earl of ARGYLE was deſired to make inquiry after the giant-child in Scotland (whereof Sir ROBERT MORAY had formerly brought in an account, which was regiſtered) whether it be yet alive; and, if ſo, how it throve and grew.

Dr. PELL moved, that ſome experiments might be made upon May-dew in this ſeaſon, concerning its weight, the ſalt to be drawn out of it, the inſects generated from it, *&c.* He added, that a certain perſon, who had abundance of warts upon his hands, by waſhing them in the May-dew of ſeveral garden herbs, as balm, ſage, *&c.* was perfectly cured of them before the end of May.

Mr. HENSHAW mentioned, that he had taken ſeveral ounces of pure ſalt out of a barrel of May-dew; and obſerved abundance of inſects, and particularly of *millepedes*, bred in ſuch dews. He added, that May-water put into a convenient veſſel will gather a conſiderable cream on the top. He was deſired, and with him Mr. EVELYN, to take care, that a good quantity of May-dew might be gathered, to make experiments with. And Mr. HENSHAW was particularly deſired to bring an account in writing of thoſe experiments, which he had already made, and to ſuggeſt new ones.

It was moved by Mr. BOYLE, that the ſalt of May-dew might be expoſed to the air, and the alterations thereupon made in it, as to weight, and the like, obſerved.

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[*] It is a letter to the Royal Society, dated April 26, 1664, and is entered into the Letter-book, vol. i. p. 143.

He mentioned likewiſe, that the French *Theatrum Agriculturæ* taught a way to make vinegar out of May-dew. The ſecretary was deſired to conſult that book, and to produce that paſſage at the next meeting.

It was deſired, that the curators of theſe experiments of May-dew would gather ſeveral kinds of dew apart; as that of corn-fields, meadows, garden-herbs, each of them apart; there being conceived to be a difference in dew, according to the ſeveral vegetables whence it was collected: which impregnate it with ſeveral qualities.

Mr. Boyle mentioned, that an acquaintance of his having gathered a quantity of May-dew, diſtilled half of it, leaving the other half undiſtilled; and that an hard winter following, the diſtilled water froze, but the undiſtilled not.

May 4. At a meeting of the Council were preſent,

The lord viſcount Brouncker,
preſident.
Sir Robert Moray.
Sir Paul Neile.
Sir Peter Wyche.
Mr. Aerskine.
Mr. Balle.
Dr. Wilkins.
Dr. Goddard.
Mr. Hill.
Mr. Colwall.
Mr. Hoskyns.
Mr. Oldenburg.

It was ordered, that Dr. Wallis be written to by the ſecretary, and deſired to preſs Mr. Hyde to tranſlate Ulug Beig, and not to tranſcribe the original till farther order: And

That the treaſurer advance ten pounds to Mr. Sutcliffe, in part of payment of the hundred pounds, which the Society intended to give him for quitting his pretenſion to Chelſea-college.

It was reſolved, that it was beſt to ſollicit the king for the grant of Chelſea-houſe, and the land belonging to it, both together: and that it was fitteſt to ſtay the demand of the grant of Chelſea-houſe, till an agreement ſhould be made about the land, it being beſt to have the houſe and land paſſed from the crown both together in one patent.

It was ordered, that the Monday's committee call upon thoſe, who had undertaken to contribute experiments for his majeſty's reception, to bring them in.

At the meeting of the Society on the ſame day,

The Magdeburg experiment was tried again in another poſition with ſucceſs. It was ordered to be tried the ſecond time at the next meeting, by exhauſting the air out of the upper glaſs, and afterwards out of the water in the undermoſt glaſs.

It was ordered, that the experiments of *aurum fulminans* in ſteel balls be proſecuted; and that Mr. Hooke provide balls fit for that purpoſe.

Mr. Hooke was likewiſe directed to provide againſt the next meeting ſome *pulvis fulminans* of ſulphur, ſalt-petre, and ſalt of tartar, as a *ſuccedaneum* to *aurum fulminans*.

Dr. Goddard was deſired to bring in his account of the former experiments with *aurum fulminans*.

Sir William Petty was deſired to give order to the operator for more experiments of breaking wood by weight.

Sir Robert Moray promiſed to bring in writing the proceſs of Monſieur Le Febure's operation of volatilizing ſalt of tartar with diſtilled vinegar and ſpirit of wine.

He informed the ſociety of two experiments, which his majeſty had lately made, by weighing himſelf before and after play at tennis. In one he found himſelf weigh three pounds leſs after the play of an hour and a half; in the other, weighing himſelf before he put off his moiſt cloaths, he found himſelf much lighter by twenty-ſix ounces, which was clearly exhaled.

Dr. Wilkins read a letter from Dr. Pope dated at Rome April 5, 1664, N. S. giving an account of ſome particulars obſerved in the kingdom of Naples; which was ordered to be entered[p], and was as follows:

" I received a letter from Mr. Hill, wherein he tells me you think it convenient I ſhould write a letter to the Royal Society. Sir, I know both them and myſelf too well, to think, that any thing coming from me (eſpecially about what I have ſeen in Italy, where a very great part of the ſociety are more verſed than I am) can be any way ſerviceable unto them: otherwiſe I ſhould not at all value my pains. The journey of Naples, which I juſt now return from making, is certainly very worth relating; and I would venture upon it at your command, if I did not verily believe, that two worthy gentlemen of your ſociety had already deſcribed it with much accurateneſs; and if they have not already made the ſociety partakers of it, they will do it without fail at their return to England, which I ſuppoſe will be next autumn: I mean Sir J. Finch and D. Baynes. However, Sir, I will venture to you alone what we obſerved, which it may be they thought not worth the taking notice of. Both going and coming we dined at Terracina (which Horace calls *Impoſitum ſaxis late candentibus Anxur*) we ſaw very eminent ruins of a moſt magnific temple of Jupiter Anxur; but, what I chiefly mention it for, it is the beſt ſpot of earth for ſimpling that I ever yet ſaw in my life, there ſcarcely growing one common tree or herb; though it was a bad time, being early in the ſpring, yet we found very great variety of

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[p] Letter-book, vol. i. p 139.

“ excellent ſimples, both trees, ſhrubs, and flowers, many of which are not in
“ France in the beſt gardens, and ſcarcely known in Rome. We only could collect
“ the names of them, this being no time for ſeed. If the ſpring produce ſo
“ much, what might one expect from the ſummer and autumn? From Naples
“ we went to the famous Grotta de Cani, paſſing under the Pauſilypus, which is
“ perforated for near a mile in the loweſt place of ſuch a hight, as a man may
“ ride through with a half pike held up; towards both the ends much higher to
“ let in light; of ſuch a breadth, that two coaches may meet therein. This
“ mountain is famed for bearing excellent Greek wine. The grotto of dogs is a
“ little cavity in the hill about twenty yards diſtance from the Lake Aniano; it is
“ about three yards long, a yard broad, and two yards high; and there is a door
“ to it, which muſt be opened with a ſilver key, before one can ſee the experiment.
“ In this grotto there ariſes very viſibly a ſteam or cloud not above half
“ a foot high, to which if a lighted torch be admoved, it goes out as if put into
“ water. It did no hurt to us, that were in it, becauſe the ſteam came not ſo high;
“ nay, putting in a weak dog, he came out holding his head up above the ſteam;
“ but when we held down his head, he fell down as dead immediately, and ſtirred
“ not. The ordinary experiment is this; hold a dog down below this ſteam
“ (which, beſides that it is viſible, the torch goes out at coming near it) he will
“ very ſuddenly, I am ſure, in leſs than four minutes, appear dead, without any
“ kind of motion: if you would not have him die, take him, and throw him into
“ the lake (take heed of drowning him) taking him out again, he is immediately
“ well and runs about. The people thereabouts, and ſome authors, attribute a
“ ſtrange revivifying quality to theſe waters, but I believe without ſufficient
“ ground; for I doubt not but that any other water will do the ſame buſineſs;
“ but we could not, for want of other water, make the experiment. We took
“ two dogs, and put them at the ſame time into the grotto, till they both ſeemed
“ dead: we took them both out together, threw one of them into the lake, who
“ recovered inſtantly and run away: we laid the other upon the ground, expecting
“ what would become of him; after a good while we perceived him to begin to
“ breath; then he cried dolefully; he ſtrived with much pain to get upon his
“ legs, but fell ſeveral times as if he had been drunk: when at laſt he could ſtand
“ upon his fore-legs, he could not for a while move his hinder-legs, as if his back
“ had been broke: it was above an hour before he recovered to go tolerably.
“ Sir, I doubt not but this ſteam is of the ſame nature with a damp in the coal-pits,
“ only this is perpetual; and it may be worth your inquiring, whether thoſe,
“ that are ſurpriſed with damps, would not recover ſooner being put into the water,
“ than being let lie in the open air; which I have heard from a worthy gentleman
“ of your ſociety is the way, by which they recover them. If I ſhould deſcribe
“ the Solfaterra, the mountain Veſuvius, and the natural ſtoves, I am certain
“ I ſhould tire you and myſelf, having already exceeded the bounds of a letter.
“ Pray, Sir, preſent my ſervice to thoſe of the Royal Society I have the honour
“ to be known to, &c.”

Dr. CHARLETON gave ſome account of the ſaid anatomical adminiſtration; and ſaid, that by his operation he had found Dr. WILLIS's cuts in the *Anatome Cerebri*, as far as he had gone, true; and that the bones of the body were boiled for the making of a ſkeleton.

He intimated, that to take off the whole ſkin, an anatomy muſt be made on purpoſe for it.

He alſo affirmed, that he had obſerved many differences between the brains of a man and a brute. He was deſired to communicate his notes upon this ſubject to the ſociety; as alſo to diſſect ſome heads of a dog, ſheep, calf, *&c.* to compare with the brains of a man, and to demonſtrate thoſe differences.

Mr. AUBREY was deſired to ſpeak with Mr. JONAS MOORE about the aſtronomical tables of Mr. HORROX.

A letter from Dr. WALLIS to the ſecretary, dated at Oxford April 30, 1664 [q]. was read, offering his own and Dr. WREN's ſervice to the ſociety in digeſting Mr. HORROX's papers in order to their being printed, but deſiring the originals, as the copies were very faulty: upon which the ſociety ordered the ſecretary to return their thanks to Dr. WALLIS and Dr. WREN, and to acquaint them with the ſociety's acceptance of their offer, and to ſend them all Mr. HORROX's and particularly the tables, as ſoon as they ſhould be obtained from Mr. JONAS MOORE.

Mr. AUBREY mentioned a new way of brewing good and laſting beer with ginger without hops; and promiſed to procure ſome bottles of ſuch beer for a proof.

Mr. HOOKE was ordered to agree with the diver between that day and the Wedneſday following, to the end, that at the next meeting a day might be appointed for a trial of the new way of diving propoſed by himſelf.

Mr. BOYLE ſhewed an experiment to elucidate the cauſe of the difficult divulſion of two contiguous marbles, by a valve immerſed in water; of which he promiſed to give an account in writing, together with other experiments lately made by him before the ſociety.

Mr. HENSHAW's experiments and obſervations concerning May-dew were read, and ordered to be regiſtered [r].

The operator was ordered to provide jars and glaſs-veſſels for the May-dew.

Dr. CROUNE, by the hands of Mr. HILL, preſented to the ſociety his little treatiſe *De Ratione motus muſculorum* [s].

The operator was ordered to provide ſome tad-poles againſt the next meeting, in order to be cut open.

It was ordered likewiſe, that Dr. CROUNE, Dr. BALLE, and Mr. HOOKE take care at the next meeting to cut off ſome ſkin of a dog; and that the operator provide a dog for that purpoſe.

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[q] Letter-book, vol. i. p. 130, 131.

[r] Original Regiſter, vol. iii. p. 25. They are publiſhed in the Philoſ. Tranſ. n° iii p. 34.

[s] Printed at London in 1664 in 4to, and reprinted at Amſterdam in 1667, in 12mo. It was publiſhed without the author's name.

May 11. The COUNCIL met, at which were preſent

The lord viſcount BROUNCKER,
 preſident.
Sir ROBERT MORAY.
Sir PAUL NEILE.
Mr. AERSKINE.
Mr. BALLE.
Dr. WILKINS.
Dr. GODDARD.
Mr. HILL.
Mr. COLWALL.
Mr. HOSKYNS.
Mr. OLDENBURG.

The treaſurer deſiring to be directed, what kind of acquittance to take from Mr. SUTCLIFFE for the ten pounds ordered to be paid him, Mr. HOSKYNS was required to draw up a form thereof.

It was ordered, that the preſident take home with him the ſociety's ſeal, in order to have it handſomely taken off by Mr. SYMONDS for Mr. HEVELIUS's diploma; and that the amanuenſis get the ornaments of the ſaid diploma ready againſt Saturday morning, and carry it to the preſident, that it might be ſealed and ſigned; and that the ſecretary diſpatch it away by the firſt opportunity.

At the meeting of the SOCIETY the ſame day,

The Magdeburg experiment was proſecuted by exhauſting the air out of the uppermoſt glaſs, and afterwards out of the water itſelf: whereupon the glaſs with the water turned uppermoſt, and the cock opened; the air remaining in the other glaſs aſcended briſkly into the water in great flakes, and the water deſcending with much more celerity than it did afterwards, when the air was let in again. To know the difference of the time whereof, it was ordered, that the operator ſhould prepare the experiment again for the next meeting, to meaſure the time of the water falling down into the other glaſs filled with common air, and that of falling into the exhauſted receiver.

The experiment of condenſing air in a ſmall glaſs with a ſucker was tried, and ſucceeded well, the air being thereby compreſſed into the ſixth part of the room, which it filled before. It was ordered, that at the next meeting a bird and a mouſe be tried in this inſtrument.

Mr. HOOKE propoſed an experiment, to ſhew in what figure the glaſs-drops are broken by dipping them in iſing-glaſs, and wrapping them about with ſome leather tied about with thread. He was ordered to make this experiment at the next meeting.

A deſcription of this experiment, and a diſcourſe upon it, and ſome other phænomena of glaſs drops, made by Mr. HOOKE, were read; and he was deſired to ſhew the following experiment mentioned by him in the ſaid diſcourſe, *viz.* Take a glaſs-cane about a foot long, ſeal up one end, then put in a very ſmall glaſs-bubble, almoſt of the ſhape of an eſſence-vial, with the open mouth towards the ſealed end: then draw out the other end of the pipe very ſmall, and fill the whole cylinder with water. Then ſet this tube by the fire till the water begin to boil, and the air in the bubble be in good part rarefied and driven out: then, by ſucking at the ſmall pipe, more of the air and vapours in the bubble may be ſucked out, ſo that it may ſink to the bottom. When it is ſunk to the bottom, in the flame of a candle or lamp nip up the ſlender pipe, and let it cool. Whereupon it is obvious to obſerve firſt, that the water by degrees will ſubſide and ſhrink into leſs room: next, that the air or vapours in the glaſs will expand themſelves ſo, as to buoy up the little glaſs: thirdly, that all about the inſide of the glaſs-pipe there will appear an infinite number of ſmall bubbles, which, as the water grows colder and colder, will ſwell bigger and bigger, and many of them buoy themſelves up, and break at the top.

It was ordered, that the Preſident, Sir Robert Moray, Sir Paul Neile, Sir William Petty, Dr. Wilkins, Dr. Goddard, Mr. Henshaw, Mr. Hill, Mr. Oldenburg, and Mr. Hooke be a committee to ſee the experiment made of diving with the leaden box and pipe, on the Tueſday following in the afternoon, meeting at Sir Robert Moray's chamber; and that the operator appoint the diver, and make the inſtrument ready for that time.

A letter from Mr. Beal written to the ſecretary concerning the tranſplanting of the Eaſt-India ſpices in the Weſt-Indies, was ordered to be communicated to Mr. Povey, in order to recommend that work to the council for foreign plantations; and Mr. Povey gave ſome account of what had been formerly in deſign concerning it, and promiſed to promote the ſame with all poſſible vigour, and to report to the ſociety the progreſs, that ſhould be made therein.

The experiment of heating both common and fulminating powder in ſteel-balls was referred to the next meeting, and Mr. Hooke was ordered to provide fulminating powder.

The gathering of May-dew being inquired after, and the operator informing the ſociety, that ſome had been ſent in by Mr. Hoskyns, it was ordered, that ſome of it ſhould be put apart, in order to obſerve the effects of its putrefaction; and that ſome cotton or wool ſhould be ſteeped in it, to ſee what quality it would contract from thence.

Mr. Boyle remarked, that the way of gathering a quantity of dew without ſheets, was to make uſe of a great glaſs filled with cold water; or rather, if it could be gotten, with ice or ſnow; whereby the dew dropping upon it will be condenſed, and fall down all along the ſides of the glaſs, like a ſtill.

May 18. At the meeting of the Council were preſent

The lord viſcount Brouncker, preſident.
Mr. Howard.
Sir Robert Moray.
Sir Peter Wyche.
Mr. Aerskine.
Mr. Palmer.
Dr. Wilkins.
Dr. Goddard.
Mr. Hill.
Mr. Colwall.
Mr. Oldenburg.

The preſident returned the ſociety's ſeal, which was put again into the cheſt with three locks, the diploma of Mr. HEVELIUS having been ſealed therewith, bearing date May 11, 1664, and being ſent away by ſea to Dantzick.

A motion being made by the preſident and Sir ROBERT MORAY on the behalf of Mr. POVEY about the reimburſing him the 23 l. which he affirmed to have expended for the ſociety upon the account of treating with Dr. KILLEGREW[t] for the Savoy by order of the council, for the uſe of the ſociety, though the ſaid treaty proved ſucceſsleſs by reaſon of ſome conditions judged by the council not fit to be accepted of; it was ordered, that the treaſurer of the ſociety ſhould reimburſe Mr. POVEY the ſaid 23 l.

It was ordered likewiſe, that the preſident, Sir ROBERT MORAY, and Sir PAUL NEILE ſhould be deſired to ſpeak with Mr. WILLIAMSON[u] concerning the beſt way of procuring from his majeſty the grant of Chelſea College: And

That Sir ROBERT MORAY ſhould ſpeak with Mr. COLE, and inform him, that when the ſociety ſhall have obtained the grant of Chelſea College, both of the houſe and land belonging to it, they will then contract with him for his intereſt in that land at a marketable rate.

At the meeting of the SOCIETY on the ſame day,

The experiment concerning the force of common gunpowder was tried by putting a ſmall thimble-full of ſuch powder into a thick cylindrical piece of ſteel, having a little cavity in the middle, and cloſed with an exact ſcrew; which being heated in a coal-fire, burſt in two places, throwing out the ſcrew. It was ordered, that the experiment ſhould be repeated at the next meeting in as ſtrong a piece of ſteel, as could be well made, and with as much care of preventing any vent, as might be. And Mr. HOOKE was appointed curator thereof.

Sir ROBERT MORAY gave an account of the diving experiment, and the unſucceſsfulneſs thereof at the firſt trial. It was ordered, that the diver ſhuld purſue the experiment, by attempting frequent practices thereof; for which end the engine ſhould be left with him. Mr. HOOKE was ordered to take care of the performance of it, and to make a report to the ſociety of the ſucceſs.

Mr. HENSHAW brought in writing ſome additional experiments to be made with May-dew; which were ordered to be regiſtered[w]; and the operator was directed to try as many of them as he conveniently could; and Dr. GODDARD was deſired to ſuperviſe him.

The ſecretary produced two letters written to him from Oxford by Dr. WALLIS, one of May 7, 1664[x], and the other of May 14[y], containing his thoughts upon the muſical propoſals of Mr. BERCHENSHA. It was ordered, that theſe letters ſhould be referred to the preſident to peruſe and conſider them, and to make report thereof to the ſociety; and that Dr. COTTON ſhould be added to the muſical committee appointed April 20, 1664.

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[t] Maſter of the Savoy.

[u] JOSEPH WILLIAMSON, eſq;

[w] Original Regiſter, vol. iii. p. 28.

[x] Letter-book, vol. i. p. 149.

[y] Ibid. p. 152.

The ſecretary produced likewiſe another letter from Dr. WALLIS of May 16, relating to the fall of hail at Oxford, the hail-ſtones being like a lump of ice, very tranſparent towards the ſides, but more opake towards the middle, of very irregular ſhapes, and of the bigneſs of $\frac{3}{4}$ of an inch in diameter.

Sir ROBERT MORAY related, that ſome years ago there had fallen a ſtorm of hail at Lyons, which had done ſo much miſchief to the houſes of that city, in breaking the windows and tiles thereof, that it was not repaired for leſs than 100,000 crowns, the hail-ſtones being of the ſize of tennis-balls, and killing a great number of men and beaſts.

Mr. BOYLE related, that a ſervant of his travelling ſome time before over a common in Lancaſhire, had obſerved, that whenever the horſe ſtruck the ground of that common, there appeared flaſhes of light, which continued a good while. He was deſired to give in writing a punctual account of this obſervation.

Dr. CHARLETON cut off a piece of a dog's ſkin, to try, whether it would grow on again.

He opened ſome tad-poles, and ſaid, that he found in them the rudiments of frogs. He was deſired to proſecute the experiment, and to let the ſociety be more fully ſatisfied about the production of frogs from the ſaid tad-poles.

Mr. HOOKE mentioned, that he knew a perſon, who had the art of ſoftening ſteel to that degree, that it might be twiſted. He was deſired to endeavour to get the ſecret, and to offer a reward for it.

Dr. CHARLETON was put in mind to ſpeak to Mr. WYLDE concerning his way of ſoftening ſteel without fire, and hardening it again. The doctor promiſed to endeavour to procure it of Mr. WYLDE.

Dr. CLARKE mentioned, that he had ſeen a dog's ſpleen cut away by Mr. PEIRCE without tying up the veſſels thereof; and that the dog ſurvived and was well. It was ordered, that the experiment be made before the ſociety by the care of Dr. CLARKE and Dr. CHARLETON; and that the operator provide a dog for that purpoſe.

The ſecretary produced a roll of ſome ſkins of parchment ſent by Mr. BEAL for the uſe of the ſociety, made by one MATTHEW WILLS of Yeovil, eſteemed by many the beſt parchment-maker in England. This roll was accompanied with a letter addreſſing the ſaid preſent, and with a deſcription of the art of making parchment, together with the figures of the ſeveral tools uſed in this art. It was ordered, that the ſaid deſcription be read at the next meeting.

The experiment of condenſing the air upon a bird was tried with this ſucceſs, that the bird was killed; and being opened, the heart and lungs of it were found to be much blown. It was ordered, that the experiment be repeated at the next day with a mouſe; and that a bird be put into the ſame veſſel without condenſing the air, to ſee how long it would live therein in the common air.

It was ordered likewiſe, that a carp's bladder be provided againſt the next meeting, to be put into the ſame veſſel: as alſo ſome tender worms, and black ſnails, to ſee what effect the compreſſion of the air would have upon them.

Mr. Hooke tried his experiment of breaking a glaſs-drop dipt in iſing-glaſs, and tied about in a piece of leather; but it not ſucceeding, he was ordered to try it again at the next meeting.

May 25. At the meeting of the Council were preſent

The lord viſcount Brouncker, preſident.
Sir Robert Moray.
Mr. Aerskine.
Mr. Balle.
Dr. Wilkins.
Dr. Whistler.
Dr. Goddard.
Mr. Colwall.
Mr. Hill.
Mr. Hoskyns.
Mr. Oldenburg.

It was ordered, that the Preſident and Sir Robert Moray be deſired to proſecute the petition for the grant of Chelſea College, and preſent ſuch a petition to the king.

At the meeting of the Society the ſame day,

The Magdeburg experiment being repeated, it was found, that the proportion of the time of the water's running into the exhauſted glaſs to that of its running into the glaſs filled with air, was as 7 to 8. It was ordered to exhauſt it better for the next meeting.

Three glaſſes filled, one with May-dew, the other two with river and pump-water, and having mint put into them, were viewed; and it was found, that in the two glaſſes, that were filled, one with river and the other with pump-water, the mint was freſh; but in that with May-dew, the mint, though of the ſame root with the other, was decayed.

Dr. Henry More was again propoſed candidate by Dr. Wilkins, and immediately elected, having been formerly choſen by the firſt charter.

Thomas Neile, eſq; was propoſed candidate by Mr. Hoskyns.

The experiment with common gunpowder in a cylindrical piece of ſteel with a little cavity, ſcrewed cloſe, was tried again, but without ſucceſs; the powder finding vent between the ſteel caſe and the ſcrew. It was ordered, that Mr. HOOKE ſhould provide the ſtrongeſt method he could, againſt the next meeting.

Dr. CHARLETON mentioning, that the dog, a piece of whoſe ſkin had been cut off and ſewed on again, had got it off; he was deſired to repeat the experiment at the next meeting, and think upon a way of ſecuring the patch.

Mr. BEAL's account of the art of making parchment was read, and ordered to be regiſtered [a].

It being mentioned, that there was a kind of parchment as tranſparent as glaſs; the preſident, who had ſeen ſuch, was deſired to procure ſome of it to ſhew the Society.

The experiment of compreſſing the air upon a mouſe was tried; and it was found, that ſhe lived, though the air was compreſſed to a fourth part of the ſpace, which it filled before. It was ordered, that the experiment be tried at the next meeting with ſome tender worms and black ſnails.

The experiment of compreſſing the air upon a carp's bladder was tried; and it appeared, that one part of the bladder was cruſhed by the compreſſion of the air into three fourth parts.

Dr. CHARLETON being called upon for Mr. WYLDE's art of ſoftening ſteel with fire, and hardening it again, made anſwer, that he had ſpoken to him concerning it; but that Mr. WYLDE eſteeming it a ſecret, he thought not fit to preſs him for the communication thereof. Dr. CHARLETON was deſired to let Mr. WYLDE know, that the Society only requeſted to be aſſured of the matter of fact, and to ſee ſuch a thing produced before them.

The experiment with the mouſe in compreſſed air was tried, by putting the glaſs in a pail of cold water; where, the air being condenſed into an eighth part, the mouſe remained alive, and was well. Hence it was inferred, that a man may breathe under water at the depth of 200 fathoms, if he can breathe and live with as thick air, as a mouſe can do.

Dr. COTTON produced ſeveral pieces of rude lead-ſtones, taken up in Devonſhire near Brent, ſome above ground, ſome under ground, though pretty near the ſurface. He affirmed, that a great number of iron mines were near this place. Some of theſe load-ſtones were tried and found pretty good.

He produced alſo ſeveral ſorts of tin-ore, one of which was taken out of a place, where the people digging it were ſtifled with the damps of the mine. Another ſort was found in the ſame mine, where ſilver-ore was digged up. He brought in an account of this and other particulars about tin-mines, which was ordered to be regiſtered [a], as follows:

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[a] Original Regiſter, vol. iii. p. 35.

[a] Ibid. p. 30.

“ Where there is any load of tin, there are uſually found ſomewhat near it ſhoad-ſtones, ſmoother than thoſe ſtones mixed with the tin in the load: theſe ſtones are ſometimes looſe on the turf, often turned up with a plough in arable ground. When theſe are diſcovered, they examine from the ſhoad upwards towards the hill, by ſinking ſeveral ſhafts, from four to ſeven or eight foot deep, until they are paſt that, which they call the looſe country, that is, a looſer ſort of earth or ſand uſually about three or four inches thick; under which if they find any tin-ſtone, they perceive the load is very near, and they ſeldom or never fail of finding it.

“ The load is known by the ſeveral colours it hath different from the other earth, and by ſome walls of ſtone or liſt of earth on each ſide of it, different in colour from both the earth and the load. The load is rarely three yards broad: one in Godolphin-ball was eleven foot; others one foot, half a foot, and much leſs.

“ The load, when mixed with ſtone, they call ſpar; when with duſt or ſand, prian.

“ It is obſerved, that all the principal loads do lie from eaſt to weſt, or ſomewhat inclining that way; but if they meet with croſs-loads, from north to ſouth, they are very inconſiderable; and the true load, when the croſs-load comes near it, breaks off from that line it was formerly in, and is removed ſometimes ſix or ten foot diſtance from it. The loads are ſome of white, others of red, others of black, others of brown colours; and when waſhed, they tinge the water accordingly. Though it be uſual, that the ſame load keep the ſame colour, yet there is an inſtance in a load at Godolphin, which at three ſeveral places has three ſeveral colours. Of whatever colour the load be at firſt, it comes afterwards, when thoroughly waſhed, to be of a black colour, and is generally called by the name of black-tin, to diſtinguiſh it from the load and melted tin.

“ When the load is taken out of the mine, the greater ſtones are broken into ſmall, and then carried to the ſtamping-mill, and is ſtamped with iron ſtamps in a little veſſel of water, which water running away through an iron plate full of ſmall holes, carries with it both the droſs and tin; which being afterwards received into two or three ſucceſſive pits, it is there buddled either with mens feet or with a ſhovel, which moving it up and down, ſeparates the ſtones and droſs from the true metal. The parts remaining, not ſtamped ſmall enough, are put again either into a crazing-mill, and ground between two ſtones, or the ſame ſtamping mill; and then the plate of the ſtamping-veſſel is changed, and the water, together with the tin, paſſeth out from that veſſel through ſmaller holes. Sometimes they lube the ſame tin, by ſtirring it in a wooden veſſel, and ſtriking the veſſel with a ſtaff, which makes the tin ſettle at the bottom; and they ſcum off the top, which is waſte.

“ Being thus ſeparated and made ſmall, it hath now the name of black-tin, and is meaſured by diſhes, which contain a gallon apiece. It is from thence carried “to the blowing-houſe, where being caſt, together with charcoal, into a furnace, as it melts, by the force of a wall-bellows, it flows out into a ſtone trough, and there they ſcum off the top of it, which is like black pitch, and is called cinders: this they do not caſt away, but ſtamping it again together with the tin-ſtone, it adds to the quantity of the tin.

“In the melting of the tin, ſome of the lighter parts of it are blown off, and ſtick in the ſeveral parts of the blowing-houſe, which they cannot well take off; and for that reaſon they ſeldom repair thoſe houſes, but rather burn them; and the tin found in them will be ſufficient to build a new houſe. When the fire is too hot, it makes the tin more apt to fly; which when they perceive, they endeavour to remedy by caſting water on it. When the cinders are ſcummed off, they put the tin into moulds, which contain about three or four hundred weight apiece, and the owner's mark is affixed on it. It is then called white tin, and is from the blowing-houſe carried to the coinage, where being poiſed and teſted, that is, examined, by cutting off parts, whether it be pure and ſoft, then it paſſeth without tarring, and the king's ſtamp is ſet on it: if otherwiſe, it is tarred, that is, leſſened in price, two, three, four, and five ſhillings, ſometimes fifteen or twenty ſhillings, a hundred. The hundred is one hundred and twenty, rather one hundred twenty-two pounds weight. Three or four gallons of the beſt black-tin uſually makes one hundred weight of white-tin: this the farmer buyeth of the owners at four pounds ten ſhillings the hundred, but ſells it at five pounds and upwards to the merchant; and the hundred, by which they ſell, is one hundred and twelve pounds weight.

“There is priant tin, mixed with earth and clay, often found in low grounds, above the ſhelf or hard earth: this they work, by conveying it through a trough of water, which running through the places they dig, and ſeparating the tin from the earth, by the help of the labourers, give to them the name of ſtream-works.”

He likewiſe mentioned an experiment made by him, of weighing a ponderous body both above and under ground; of which he promiſed to give an account in writing at the next meeting.

The weight in the above mentioned experiment being found lighter at the bottom than on the top, it was thought worth the examining, whether it proceeded from the different degrees of heat and cold, or from different degrees of thickneſs, as that is cauſed by more or leſs weight of the air: and for this purpoſe it was ordered, that Dr. COTTON and Dr. POWER ſhould be deſired, the latter by Dr. CROUNE, to take a globular glaſs of about a pound weight, and to weigh it at the top and bottom, to examine the conſtitution of the medium: for if the difference of the weight ariſes from the thickneſs and thinneſs of the air, the glaſs will weigh much leſs below than above ground; if it be from heat and cold, a ſealed thermometer was thought fitteſt to determine that.

Dr. COTTON produced a paper, containing a ſtory of a mooriſh place near Killington in Lanceſton-road, where the impreſs of ſome horſes and mens feet in the ground had appeared fiery, and much more ſhining than glow-worms; the graſs gathered in that place keeping the luſtre in mens hands for a good while: which paper was ordered to be regiſtered [b], as follows:

" Being Monday, on my return with Sir JOHN CORITON, bart. and his clerk,
" WILLIAM STEPHENS, from the lord biſhop's viſitation at Lanceſton, about an
" hour, in a miſty dewy night, at Hinxen, almoſt a mile beyond Kellington in
" Devonſhire, in Lanceſton road, in a mooriſh place of ſome forty foot in length,
" the impreſs of our horſes and our own feet upon the ground appeared fiery,
" much more fiery than glow-worms; the graſs we gathered in thoſe places, where
" we or our horſes trod, reſerved the luſtre in our hands, e'er we came to the
" water within a quarter of a mile from Kellington, where watering our horſes
" we obſerved it, but almoſt extinguiſhed, only a ſpark here and there: at New-
" ton, two miles thence, we viewed it by candle-light, as alſo the next day, and
" found it coarſe ſpiry graſs, of an inch or little more in length, ſuch as ordi-
" narily grows on downs."

Mr. BOYLE acquainted the Society with his intended receſs into the country, and being deſired to bring in writing the account promiſed by him, of the Paſcalian experiments, before he left London, made anſwer, that he would leave this matter with Mr. HOOKE to proſecute the ſaid experiments, and to give an account thereof.

It was ordered, that the diving experiment ſhould be proſecuted in the Thames; and that it be made likewiſe in a tub before the Society at the next meeting; when the diver ſhould be ſummoned to attend.

Dr. CROUNE offered to make an experiment at the next meeting, of choaking a chicken, and of reviving it by blowing with a quill into the lungs. It was ordered, that a chicken be provided by the operator for that purpoſe.

June 1. At a meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER, preſident.
Sir ROBERT MORAY.
Sir PAUL NEILE.
Sir ANTHONY MORGAN.
Mr. AERSKINE.
Dr. GODDARD.
Mr. HILL.
Mr. COLWALL.
Mr. HOSKYNS.
Mr. OLDENBURG.

The petition to the king for granting the houſe of Chelſea-college, and the land belonging thereto, to the ROYAL SOCIETY, was read, and, after ſome alterations, agreed upon, as follows:

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[a] Original Regiſter, vol. iii. p. 33.

" To the KING's moſt excellent majeſty,

" The humble petitition of the Preſident, Council, and Fellows of the " ROYAL SOCIETY of London for improving natural knowledge,

" *Humbly ſheweth,*

" THAT the houſe called Chelſea college, and the land heretofore belonging " thereunto by the donation of your majeſty's royal grandfather, king " JAMES, of bleſſed memory, are now (as your petitioners do humbly conceive) " at your majeſty's diſpoſal.

" Your petitioners therefore do humbly pray, your majeſty will be graciouſly " pleaſed to give order, that a bill be prepared for your royal ſignature, granting " to your petitioners and their ſucceſſors the ſaid houſe and lands, that your pe" titioners may thereby be in ſome meaſure enabled to proſecute the deſign, for " which your majeſty was pleaſed to conſtitute them a corporation.

" *And your petitioners ſhall ever pray.*"

It was ordered, that the preſident, Sir ROBERT MORAY, Sir PAUL NEILE, and Mr. AERSKINE, be deſired to preſent this petition to his majeſty, as ſoon as may be: And

That Mr. HILL the treaſurer do pay to Mr. SUTCLIFFE the ſum of ten pounds, and take a receit for the ſame, notwithſtanding former order.

At the meeting of the SOCIETY on the ſame day,

Dr. HENRY MORE was admitted; and Mr. THO. NEILE elected.

The experiment of breaking a caſe of ſteel with gunpowder was repeated; and there was taken two penny-weight and an half of powder, and put into the little cavity of the ſaid caſe, and a ſcrew wrought into it as exactly as was poſſible. The event was, that the caſe being heated, the powder broke a little hole through the bottom of it. The Society conceiving, that the caſe was not wrought equally ſtrong, ordered, that it ſhould be tried again at the next meeting, and that the caſe ſhould be as even and ſtrong as could be; and Mr. HOOKE be the curator of the experiment.

The Magdeburg experiment was repeated, and the time of the water's running out of one glaſs into the other exhauſted glaſs, being compared with that of the water's running out into the glaſs with intromitted air, it was found by a minute-watch, that the time was two minutes to four. It was obſerved alſo, that the water ran out into the exhauſted glaſs with very little noiſe; and that the glaſſes being inverted ſo, as that the exhauſted one of air was beneath, and that which was full of water (freed alſo from air) above, there aſcended (to ſhew that always ſome air is remaining, notwithſtanding the moſt careful exhauſtion) large bubbles into the glaſs with water; which bubbles were like flakes, riſing up with a ſmart motion.

Dr. CROUNE made the experiment of choaking and reviving a chicken with good ſucceſs; for having choaked with his finger the chicken in ſuch a manner, that there appeared no ſigns of any more life, he put a ſlender glaſs-pipe into the throat of the fowl, and through it blew air into its lungs; whereupon within a little time it came to itſelf, and lived again. It was ordered, that at the next meeting two chickens ſhould be choaked, and one of them blown into, the other not, to ſee whether both would recover.

The diving experiment was tried, by ſinking the leaden box with air under water in a tub, and letting the operator reſpire the air in the ſaid box by a pipe, his noſe being kept ſtopt all the while of his drawing in the air of the box, which laſted four minutes by a minute-watch, but might have been continued longer, if the operator had ſtood in a more convenient poſture.

Dr. COTTON's experiment of weighing a piece of braſs above and under ground was read, and ordered to be regiſtered [c], as follows:

" In my inquiry after tin-works, underſtanding there was at Godolphin-Ball " one perpendicularly ſunk thirty-five yards deep, I went to it, and having exa- " mined its depth, I took a twine of thirty-ſix yards long (which weighed a quar- " ter of an ounce) and unhooking one of the ſcales, in which it was weighed, I " tied one end of the twine to the ring, from which I unhooked the ſcale, and the " other end of it to the hook of the ſame ſcale, putting half a pound weight of " braſs in each ſcale, and a quarter of an ounce more in the ſcale above the earth, " to counterpoiſe the twine tied to the other ſcale, which one of the tinners car- " ried down to the bottom of the mine. The tinner in the bottom of the mine " having that ſcale in his hand, which was tied with the twine to the end of the " beam, I and others of the company, who were with me, held the beam of the " ſcales over the mine about three or four foot above the ſurface of the earth, and " cauſing both ſcales to be left at liberty, we found, that the ſcale above the earth " was much too heavy for the ſcale in the mine. Whereupon we took out of the " upper ſcale the quarter of an ounce, which was placed in it, as a counter-ba- " lance againſt the twine, which tied the lower ſcale to the beam: that being taken " out, the weight ſeemed even, the beam appearing parallel to the earth, and the " tongue perpendicular. We then demanded of the tinner in the mine, how far " the ſcale was from the bottom, and he telling us about two foot, we held the " beam about two foot lower, and then perceived the higher ſcale much to pre- " ponderate, the other ſcale touching the bottom of the mine: then raiſing " the beam two or three inches, the lower ſcale did preponderate, till we " directed the tinner to examine, whether any earth ſtuck about the lower ſcale, " which he finding and wiping it off, the balance became even, as formerly; or " rather the higher ſcale a little preponderating."

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[c] Original Regiſter, vol. iii. p. 54.

Dr. CHARLETON reported from Mr. WYLDE, that he had promiſed to ſhew the ſociety, as ſoon as conveniently he could, the experiment of ſoftening ſteel without fire, and of hardening it again.

Mr. BOYLE ſhewed the lateral preſſure of liquors with a pipe bent at right angles; whereby having put oil of turpentine into the greater pipe, and cloſed the top of it with his finger, he immerſed it into water; by the forcing of which in at the hole of the ſmaller end, the oil was driven up to an equal hight with the ſurface of the water.

The lord BRERETON being deſired to give the ſociety an account of the logs riſing in a lake belonging to him, as often as the head of his family approacheth to death, related, that he had not long ſince, upon his father's death, made a very ſtrict inquiry after it, but found cauſe to believe that tradition falſe.

Mr. BOYLE ſhewed the ſociety a volatile ſalt of anniſeeds, having the genuine ſmell and taſte of anniſeeds, but unlike to all kinds of volatile ſalts, whether acid, ſulphureous, or urinous.

He ſuggeſted it as worth the inquiry, whether volatile ſalts, though they affect the taſte equally, are equal or not in weight, ſo that by weighing them it might be found, of what kind this or that volatile ſalt might be, according as it ſhould prove heavier or lighter.

Mr. PACKER produced a piece of an elm-bark, which, after it was cut, ſeemed on the outſide petrified. He promiſed to give the account of it in writing.

It was referred to the next meeting, to conſider of the beſt way of putting the committees lately eſtabliſhed upon action; in order to which the ſecretary was directed to have then in readineſs ſuch papers, as have been addreſſed to him concerning ſeveral matters of the cognizance of thoſe committees, to recommend them to their conſideration; and alſo to cauſe the amanuenſis to have ready a liſt of the ſaid committees, and of all the perſons nominated for them, to be put up in the public meeting-place of the ſociety.

Mr. HOOKE was ordered to bring in two or three good experiments at the next meeting.

Dr. CHARLETON was deſired to bring in his obſervations concerning the differences between the brains of a man and brutes.

June 8. At a meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER, preſident.
Mr. HOWARD.
Sir ROBERT MORAY.
Sir ANTHONY MORGAN.
Mr. AERSKINE.
Mr. BALLE.
Dr. WILKINS.
Dr. GODDARD.
Dr. WHISTLER.
Mr. PALMER.
Mr. HILL
Mr. COLWALL.
Mr. OLDENBURG.

The validity of Dr. Dacres's election into the place of profeſſor of geometry in Greſham-College [d] being queſtioned, upon information given, that the lord mayor of London was not of the committee, and yet by his preſence had carried the election by a caſting vote; it was ordered, that Dr. Wilkins, Mr. Palmer, and Mr. Colwall be deſired to conſult Mr. Ellise about this buſineſs, how it might be redreſſed, to do juſtice to Mr. Hooke, who had five votes, whereas Dr. Dacres had but four, excluſive of that of the lord mayor; and that in order to this redreſs, they ſhould well inform themſelves, whether the lord mayor was nominated one of the committee; or elſe, whether he was of cuſtom authoriſed to be always of every committee, if he pleaſed to be ſo.

Sir Robert Moray acquainted the council, that the petition for the grant of Chelſea College was preſented to the king; and that Sir Henry Bennet, one of his majeſty's principal ſecretaries of ſtate, was to receive his orders for a reference upon it.

It was ordered, that Dr. More and Dr. Pell be excuſed from all payments till farther order: And

That the keeper of the repoſitory deliver nothing out of it without a written order.

At the meeting of the Society on the ſame day,

Mr. Edward Smith was admitted.

The powder experiment was tried again with a ſtronger caſe of ſteel, and the quantity of two penny-weight and an half in the ſmall cavity thereof, the ſcrew being very exactly put in. The event was, that the caſe cracked on the upper ſide, the ſcrew remaining firm in its place. It was ordered, that it ſhould be repeated at the next meeting with a yet ſtronger caſe, a leſs cavity, and leſs powder, and as deep a ſcrew as might be.

The experiment of breaking two pieces of fir, one horizontally or tranſverſely, the other perpendicularly or directly, was made after this manner: each piece was cut croſs the grain: both were of an inch diameter in the place where they were to be broken. One of them was laid horizontally; the weight put on at ſix inches diſtance from the place where it was to be broken, which was done with 9 pounds 4 ounces and a quarter, beſides the weight of the piece itſelf of eight inches long, and an inch and an half ſquare. The other was broken perpendicularly in the place, in which it was deſigned to be broken; which was done by 163 pounds and $\frac{3}{4}$ of an ounce. It was ordered, that this kind of experiments be proſecuted by Mr. HOOKE in other kinds of wood, to ſee, whether the ſame proportion holds therein.

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[d] Upon Mr. Isaac Barrow's reſignation of the profeſſorſhip of geometry in Greſham-College, the Royal Society, who met there, were deſirous, that Mr. Hooke might be choſen to ſucceed him; ſince by that means he would be near at hand to attend their ſervice, with greater readineſs for them, and leſs trouble to himſelf. But Arthur Dacres, M. D. being competitor with Mr. Hooke, the election was declared in favour of the former on the 20th of May 1664, and he was accordingly admitted, but reſigned upon the 20th of March following, and was ſucceeded by Mr. Hooke. Dr. Ward's Lives of the profeſſors of Greſham-College, p. 169.

Sir ROBERT MORAY produced the extreme part of a ſubſtance ſuppoſed to be either of the horn or tooth of that fiſh, which ſome months before run it into the lower part of an Engliſh ſhip not far from Barbados, and, to diſengage himſelf, had with great force broken it off, raiſing in the ſtruggling ſo great ſeas, that being caſt into the ſhip, they reached as high as to half the mizen-maſt, according to the relation of the maſter of the ſhip, who had brought it home, and preſented it to his majeſty, from whom Sir ROBERT MORAY brought it to the ſociety, who deſired him to make their acknowledgments to his majeſty for this grace and favour.

This piece being weighed in air and water, it was found to weigh in the air 13 ounces 10 penny-weight 9 grains; in the water 6 ounces 14 penny-weight 20 grains; the difference being 6 ounces 15 penny-weight 13 grains. The water to the horn was almoſt as 1 to 2.

Monſieur COCK, a Swediſh gentleman, being, upon the motion of the ſecretary, permitted to be preſent at this meeting, produced ſeveral ſorts of ore, and ſome petrified pieces in Pool's hole in Derbyſhire; among which there was one piece of tin-ore, dark-brown, ſhining, variouſly figured, and heavy, ſuppoſed by the producer to be almoſt all perfect tin. Being weighed in air and water it was found to weigh in the air 3 ounces, 8 penny-weight, $11\frac{1}{4}$ grains; and in the water 2 ounces, 17 penny-weight, $6\frac{1}{4}$ grains, the difference being 11 penny-weight 5 grains. The water to the tin-ore was as 1 to $6\frac{41\frac{3}{4}}{278}$, that is, as almoſt 1 to $6\frac{1}{8}$.

Dr. CHARLETON's diſcourſe concerning certain differences obſervable betwixt the brain of a man and the brains of other animals, was read, and ordered to be tranſcribed[e], and kept for the comparing of the particulars thereof with the *autopſia* in anatomical adminiſtrations; as alſo to be communicated to Dr. WILLIS, ſeveral of whoſe opinions, delivered in his *Anatome Cerebri*, are therein impugned. It was ordered likewiſe, that what ſhall paſs between thoſe two doctors upon this occaſion, ſhall not be made public without their conſent.

Mr. BOYLE related ſome obſervations of his concerning the effects of a clap of thunder and lightning on the 7th of that month of June, about four in the afternoon, about the ſign of the Poet's head on the high-way, going up from St. James's houſe. This account was ſeconded by the following one of Mr. HOOKE in writing, which was ordered to be regiſtered[f], as follows:

"I had almoſt all the morning obſerved very odd commotions of the air, ſuch "as I have ſeveral times before taken notice of to precede thunder: that is, I "took notice by means of the motion of ſeveral clouds, that were in very different

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[e] A copy of it is extant in Preſs B. B. vol. B.

[f] Original Regiſter, vol. iii. p. 41.

“ ſtations as to their hight, that there were ſeveral very ſwift currents of the air above, the higheſt moving very ſwiftly to the north, the next below that toward the ſouth-eaſt, and the air below was very variable, and for the moſt part differing: and this was much more conſpicuous, by reaſon of the clouds, a little before the thunder began, which was about three o'clock.

“ I had taken notice of ſeveral pretty big claps of thunder before that, and had likewiſe obſerved what I had done very often formerly at other times; namely, that the rumbling noiſe after the firſt great clap ſeemed to be ſeveral echos from diſtant places: next that preſently after the noiſe of the thunder-clap, the rain began firſt to fall; and if it rained when it thundred, it immediately after the clap poured down much faſter, much as if a gale of wind had ſuddenly ſhook a tree, all whoſe leaves are full with drops of water.

“ The flaſh of the lightning, and the noiſe of the thunder, were both as great as I have ſeen or heard in the day-time; the light being ſo great, that I ſtarted at it, it giving a ſudden glaring flaſh of light upon the paper, on which I was looking, as if ſome powder had been kindled hard by me; and preſently looking out of my window, which ſtood open, I heard a hideous crack of thunder, which ſeemed to me juſt over the very houſe where the miſchief was done.

“ About an hour or two after I was informed of the hurt the lightning had done to a man and a houſe in Piccadilly, juſt over againſt St. James's; and going immediately to ſee it, I found the outſide of the houſe in ſeveral places torn, the weſt corner of the roof being very much torn, the tiles being thrown off, the laths beat inward, and a good part of the brick wall thrown out into the ſtreet: the great middle bars of the weſtern windows were ſtrangely torn; the whole pieces of rimber much ſhaken, and yet for the moſt part the glaſs, that was near it, was whole. It had much torn likewiſe the timber, bricks, and glaſs of the higheſt north-weſt window; the loweſt north-weſt window was ſinged as it were in two or three places, and the lead a little melted, and the timber ſomewhat blacked; but the glaſs was not broken, that was held by thoſe melted leads. It had likewiſe broken a great ſplinter out of a door that looked eaſtward, and much torn the brick-wall hard by it.

“ Going into the houſe I found the man, that had been hurt with the lightning, who was an old bird-catcher: he was very much bruiſed about the face and all bloody, ſpitting out of his mouth very much blood, which ſeemed to come from his mouth only, and not from any hurt within. I could not get any words from him, but the man, that was by him when he fell, and was ſtruck down upon his knees alſo, told me, that he felt nothing but a ſudden ſtrong wind; but that the other was ſtruck down dead, or in a ſwoon. The man the next day was pretty well, but very ſore about the head and face. Viewing the houſe from top to bottom, I found the higheſt room or garret to be moſt hurt. The cieling juſt under the place, where tiles were beaten off, was beaten all down upon the floor, and through the brick-wall juſt by it there was a hole made about an inch over, as if a bullet had broke in; and from it to the window,

" which was about a yard, the wall was raſed very deep, as if a great bullet had " raſed it; and the window was very much ſhattered and raſed as if it had been " beaten; but there was no ſign any where on the wood of the impreſſion of a " bolt, but ſeveral parts of the wall were raſed, as if bullets had grazed on them.

" A fellow, that kept the gate, told me, that he was ſtanding at his door when " the flaſh came, and that he ſaw it come from over St. James's-houſe, and dart " upward toward this corner with exceeding great celerity, looking like a piece " of glowing red-hot iron: that he ſaw not whither it went, but heard a great " noiſe at the corner houſe, beſides the hideous crack of thunder. That pre- " ſently looking into Piccadilly, he ſaw a peaſe-cart overturned, horſes and all, " and the two men fallen: a woman ſitting in the cart was much bruiſed by the " fall of the cart upon her, but the horſes were not hurt. There were alſo ſeveral " brickmakers and carpenters on the other ſide of the way, which were all over- " turned by the violence of the wind, but none hurt.

" One, that was ſitting for ſhelter under a penthouſe, told me, that he ſaw not " the fire, but only the light of the flaſh; that two men, that were at the other " ſide of the board againſt which he leaned, were both ſtrucken backwards, but " without any hurt. That it removed him from the corner to the middle of the " ſeat, but hurt him not. That he ſmelt a great ſmell of brimſtone, and was " almoſt deaf with the noiſe of the crack: in which laſt particular they almoſt " all agree, ſome ſaying it ſmelt like brimſtone, others like gunpowder.

" I could not perceive any ſign of fire, but only in one place of the outſide of " a window, where it had a little melted the lead, and a little ſmutted or ſinged " the place; moſt of thoſe effects ſeeming to have proceeded from a violent mo- " tion of the air."

Mr. Packer brought in writing what he had related at the preceding meeting concerning a piece of an elm-tree, which was outwardly petrified. It was ordered to be regiſtered[s], and was as follows:

" On a bank in a cloſe of Mr. Purefoy, a little beyond the ſheep-pens, near " his houſe called Wadley, a mile from Farringdon in Berks, there grows an " elm, which hath now loſt the top and is grown hollow, containing near a tun " of timber: from the butt of the ſaid tree, one of the ſpreading claws having " been formerly cut off with an axe, that part of the butt, from whence the ſame " was ſevered, being about a foot and half above the ground, and inward within " the trunk of the tree, hath contracted a petrified cruſt about the thickneſs of a " ſhilling all over the woody part within the bark, the marks of the axe alſo re- " maining very conſpicuous with this petrified cruſt upon it. By what means it " ſhould thus happen, cannot well be conceived; in regard there is no water near " it, the part above the ground, and out of the weather, the tree yet growing, " unleſs being cut at ſome ſeaſon when the ſap was flowing, the oozing of the " ſap might become petrified by the air, and the tree become rotten and hollow

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[s] Original Regiſter, vol. iii. p. 40.

“ inward ſince that time, which how long ſince, is not known. This is a piece
“ of that cut off by Mr. PACKER in March 1663.”

Mr. PACKER related ſome conſiderable obſervations about damps in certain mines: which he was deſired to make fuller inquiries after, and to bring the account in writing.

The liſts of the ſeveral committees for the improvement of ſeveral philoſophical ſubjects being conſidered, the ſociety thought proper to nominate a chairman for every one of them, and to appoint times and places for their meetings:

The lord BROUNCKER for the mechanical committee, to meet at his lodgings the firſt and third Saturday of the month, in the morning, about nine of the clock:

Dr. GODDARD for the aſtronomical and optical committee, to meet at his lodgings in Greſham-College the firſt and third Monday of the month, in the afternoon about two of the clock:

Dr. ENT for for the anatomical committee, to meet at his houſe the and Friday of the month, in the afternoon about two of the clock:

Dr. GODDARD for the chemical committee, to meet at his lodgings the ſecond and fourth Saturday of the month, in the afternoon at three of the clock.

Mr. HOWARD for the georgical committee, to meet at his lodgings in Arundel-houſe the firſt and third Thurſday of the month, in the afternoon at two of the clock:

Dr. MERRET for the committee of collecting hiſtories of trades, to meet at his lodgings in the College of Phyſicians the and Tueſday[h] of the month, in the afternoon at two[i] of the clock:

Mr. HOSKYNS for the committee for collecting philoſophical phænomena and experiments, to meet at his lodgings in the Temple the ſecond and third[k] Thurſday of the month, in the afternoon at two of the clock:

Mr. POVEY for the committee of correſpondence, to meet at his lodgings in Lincoln's-inn-fields the third Friday of the month, in the afternoon at three of the clock.

June 15. At a meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER,
preſident.
Mr. HOWARD.
Sir ROBERT MORAY.
Sir PAUL NEILE.
Sir PETER WYCHE.
Mr. AERSKINE.

Mr. BALLE.
Dr. WILKINS.
Dr. GODDARD.
Mr. HILL.
Mr. COLWALL.
Mr. HOSKYNS.
Mr. OLDENBURG.

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[h] Firſt and third Tueſday MS. paper of Dr. PELL.

[i] Five, ibid.

[k] Fourth, ibid.

Sir ROBERT MORAY reported, that Mr. Secretary BENNET had acquainted him, that the king had referred the petition of the ſociety concerning the grant of Chelſea-College to the conſideration of the archbiſhop of Canterbury, the lord chancellor, lord privy ſeal, biſhop of London, and lord ASHLEY, or any two of them.

It was ordered, that the lord viſcount BROUNCKER, Sir ROBERT MORAY, and Sir PAUL NEILE take farther care of ſolliciting this affair, and of attending the referees of this petition.

At the meeting of the SOCIETY on the ſame day,

Mr. THOMAS NEILE was admitted.

Sir ROBERT MORAY preſented from Mr. HENRY ROBINSON to the ſociety a piece of rock-ſalt with two moving blebs in it.

Dr. WILKINS was deſired, in a letter to Dr. POPE, to make inquiry after a book of one Signior CESARE, concerning the change of the meridian line, whether it were to be had in Italy.

It was ordered, that Sir ROBERT MORAY, Mr. BALLE, and Mr. HOOKE ſhould meet at a time convenient for them to make an obſervation concerning the variation of the needle, which was affirmed by Mr. BOND to be then 1° 30′ weſtward.

Mr. BOYLE mentioned, that it would be worth trial what power intenſe cold hath upon loadſtones, by incloſing ſome of them in ice in winter.

Mr. HOOKE affirmed, that a loadſtone in winter taketh not up ſo much iron, as in ſummer.

The experiment of powder in a caſe of ſteel, much ſtronger than before, was again tried, but without any report or other viſible effect; which was aſcribed to the want of ſufficient heat. It was ordered, that the fire be made ſtrong enough at the next meeting for the repeating of the experiment.

A piece of a dog's ſkin was cut off from the neck, and ſtitched on again, to ſee, whether it would grow on a again. The operator was charged to have a ſpecial care of the dog, that he might not ſcratch off the patch.

Dr. WILKINS mentioned ſomething of a ſerpentine-ſtone brought out of the Indies, which was affirmed to extract poiſon, and ſo to cure the bitings of venemous animals, by being applied to the wound, and by ſucking out the venom; of which being ſatiated it falls off from the wound of itſelf, to which it before cloſely adhered, and being thrown into the water raiſeth a fermentation therein, and ſo purgeth itſelf; whereupon it may be *de novo* applied to draw out more poiſon till the cure be completed. He alledged, that ſome body had aſſured him of an inſtance of a cure done in England in the manner above mentioned, in a man bitten by a viper.

Mr. **Oldenburg** ſeconded this relation, only with this difference, that, according to the account of Dr. **Moselaer**, a German phyſician reſiding in London, this ſtone, to be found in the Eaſt-Indies in Pegu (whence one had been ſent by Mr. **Oxendon**, an Engliſh gentleman, to his lady, who had preſented the ſaid doctor with it, of $\frac{3}{4}$ of an inch diameter, of a greyiſh colour) purged itſelf not in water, but in milk; the experiment having been made with ſuch a ſtone by Mr. **William Molins** upon a man bitten with a viper.

It was mentioned by Dr. **Wilkins**, that the biting of Engliſh vipers, eſpecially in the cold and wet ſeaſons of the year, ſeldom are found mortal.

This was ſeconded by Dr. **Balle**, who added, that in ſome parts of Italy, as about Padua, there was a great difference amongſt vipers, as to their poiſonouſneſs; the phyſicians in thoſe parts chooſing the mountain-vipers as very good for their treacle, and rejecting the low-ground ones, as of ſmall virtue, and ſeldom mortally venemous.

There were made two experiments of breaking wood; the one of them a cylinder of pear-tree wood of $\frac{3}{4}$ of an inch diameter; which, the weight being hung at $1\frac{1}{2}$ inch off was broken tranſverſely with $6\frac{1}{2}$ pounds, the weight of the ſcale being 5 pounds; in all $11\frac{1}{2}$ pounds; perpendicularly with 183 pounds. The other was with a like cylinder of wainſcot broken tranſverſely, with 7 pounds, and the weight of the ſcale 5 pounds, in all 12 pounds; perpendicularly with 173 pounds.

Mr. **Hooke** was put in mind of the experiment propoſed formerly by him of rendering wood hard and tough for duration by boiling it in tar.

Mr. **Howard** ſuggeſted, that this experiment might be tried upon willows.

The ſecretary brought in and delivered to Mr. **Balle** for Dr. **Cotton**, and to Dr. **Croune** for Dr. **Power**, the paper, that contained the methods of diſcovering the reaſon, why the weight of bodies differs above and under ground.

Occaſion being given to conſider, whether the fulmination of gold-powder proceeds from the ſalt left in it, or not? Mr. **Boyle** ſuggeſted, that it might rationally be aſcribed to the texture reſulting from the combination of the ſalt with ſuch and ſuch bodies.

Mr. **Hooke** propoſed, that a certain inſtrument contrived by him might be made, to try refractions in, whether they hold by ſinus's.

June 22. At a meeting of the **Council** were preſent

The lord viſcount **Brouncker**, preſident.
Sir **Robert Moray**.
Sir **Paul Neile**.
Sir **Anthony Morgan**.
Sir **Peter Wyche**.
Mr. **Aerskine**.
Dr. **Goddard**.
Mr. **Hill**.
Mr. **Colwall**.
Mr. **Hoskyns**.
Mr. **Oldenburg**.

It was ordered, that Mr. **Hill** and Mr. **Hoskyns** confer with Sir **William Petty** and Mr. **Graunt** concerning the manner and form, in which it might be moſt proper for Sir **John Cutler** to put in execution his promiſe of giving fifty pounds a year to Mr. **Hooke** during his life for the reading of the hiſtories of trades in Greſham-College.

It being mentioned, that in caſe Mr. **Hooke**'s microſcopical obſervations ſhould be printed by order of the ſociety, they might be peruſed and examined by ſome members of the ſociety; the lord viſcount **Brouncker** was deſired to undertake this peruſal, and to communicate the manuſcript, after his peruſal of it, to whom of the ſociety he ſhould think fit.

At the meeting of the **Society** on the ſame day,

Dr. **Pell** was joined to the curators appointed at the preceding meeting for making the obſervation of the variation of the magnetic needle in White-hall garden.

He mentioned, that he had written a ſmall exercitation upon Mr. **Gellibrand**'s *Mathematical diſcourſe upon the variation of the magnetic needle; together with the admirable diminution thereof lately diſcovered*[1]; and he was deſired to communicate it to the ſociety.

He intimated, that it was difficult to draw a ſtanding aſtronomical meridian to compare with a magnetical meridian.

He likewiſe remarked, that it would be very proper to provide an exceeding good loadſtone, to be kept at Trinity-Houſe, for all mariners, who go to ſea, to touch their needles upon for an uniform direction.

Mr. **Colwall** affirmed, that Mr. **Bond** had made tables of the variation of the needle, according to his own hypotheſis, by him as yet concealed.

The operator reported, that the diver had been under water with the new inſtrument a pretty good while; but that he wanted ſome fit glaſſes for his eyes.

Mr. **Hooke** promiſed to prepare a pair of convenient ſpectacles for that purpoſe.

The dog, that had a piece of his ſkin cut off at the former meeting, being inquired after, and the operator anſwering, that he had run away, it was ordered, that another ſhould be provided againſt the next meeting for the like experiment.

It was ordered likewiſe, that another dog ſhould be provided againſt the next meeting, to cut out his ſpleen, without tying up the veſſels thereof, according to the ſuggeſtion of Dr. **Clarke**.

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[1] Printed at London 1635, in 4to.

The experiment of the glaſs-cane filled with water, and a little vial in it, was made with ſucceſs; the water (as this experiment was ordered, and is ſet down in the Journal of May 11, 1664) ſhrinking into leſs room, and the air expanding itſelf ſo as to buoy up the little glaſs; and an infinite number of ſmall bubbles appearing about the inſide of the glaſs pipe, which, as the water cooled, ſwelled bigger. It was ordered, that this experiment be repeated at the next meeting.

There were ſeveral experiments made of the ſtrength of beech-wood, by breaking ſeveral pieces thereof. One, being a quarter of an inch diameter, and an inch and half long, was broken horizontally with twenty-four pounds. Another piece, of half an inch diameter, and three inches long, was broken horizontally with ſeventy-four pounds. A third piece, of a quarter of an inch diameter, and ſix inches long, broken horizontally with four pounds ſeven ounces and half. A fourth, of half an inch diameter, and ſix inches long, broken horizontally with thirty-ſeven pounds.

Mr. Packer mentioned, that the ſeaſon, wherein wood is cut, and the age of it, and the different ſoils where it grows, make a great difference in one and the ſame kind of wood, as to its ſtrength and toughneſs.

Dr. Goddard moved, that experiments might be made of ſeveral ſorts of wood of the ſame dimenſions, both with the grains direct and tranſverſe. It was ordered, that pieces of fir and elm be provided againſt the next meeting, and broken by weight, both with the grain direct and tranſverſe, to ſee whether the fir in the tranſverſe poſition would hold as much as elm.

Sir William Petty intimated, that it ſeemed by the ſcarcity and greater rate of knee-timber, that nature did not furniſh crooked wood enough for building: wherefore he thought it would be fit to raiſe by art, ſo much of it in proportion, as to reduce it to an equal rate with ſtrait timber.

The experiments for the next meeting, beſides the above mentioned, were appointed: 1. The choaking and reviving of chickens, by Dr. Croone. 2. The celerity of falling bodies with Mr. Hooke's new inſtrument, to be tried from Mr. Wilson's room. 3. To cut the ſteel caſe, wherein the powder-experiment was formerly tried in a good fire without any report, to ſee what is become of the powder.

It was ordered, that the inſtrument propoſed by Mr. Hooke for meaſuring refractions, ſhould be made with all ſpeed.

June 29. At a meeting of the Council were preſent,

The lord viſcount Brouncker, preſident.
Sir Robert Moray.
Sir Paul Neile.
Sir Peter Wyche.
Mr. Aerskine.
Dr. Goddard.
Mr. Hill.
Mr. Hoskyns.
Mr. Oldenburg.

Mr. Sutcliffe ſoliciting the payment of the ninety pounds remaining, was deſired to have patience till the attorney-general had made a report concerning the king's power of granting Chelſea-college, and the land belonging to it.

Sir Robert Moray reported, that the attorney-general had appointed the Saturday following, to give a report concerning Chelſea-college.

At the meeting of the Society on the ſame day,

Dr. Willis cauſed his book *De Anatome Cerebri* to be preſented to the Society by the hands of Dr. Bathurst; by whom alſo he excuſed himſelf for not having preſented it ſooner, as alſo for not having owned himſelf a member of the Society in his book, alledging his want of confidence for the one, and that of an example for the other. The Society deſired Dr. Bathurst to return their thanks to Dr. Willis, both for the preſent, and for the civility of his excuſe; and ordered, that Dr. Charleton's diſcourſe concerning the difference between the brain of man and the brains of other animals, ſhould be communicated to Dr. Wallis by the care of Dr. Bathurst.

Dr. Croune tried again his experiment of choaking and reviving a chicken, but without ſucceſs. There were taken two chickens, and both, by compreſſion with his fingers, choaked together in three minutes ten ſeconds; and one of them laid by, to ſee whether it would recover without art. The other was blown into by a ſmall pipe through the larynx into the lungs; but neither of them recovered. Dr. Croune was deſired to make this trial ſeveral times privately, to be the more ready in making it before the Society.

Sir Robert Moray produced a glaſs with dead cantharides in it, that had been there ſo for the ſpace of three years, the mouth of the glaſs having been covered with a paper; but there appeared in it ſome ſmall living flies, ſuppoſed to be generated from the dead cantharides. It was recommended to Mr. Hooke, to look upon the flies with a microſcope.

Dr. Goddard moved, that Mr. Hooke might be deſired to view a viper's tooth in a microſcope, and to give an account of the obſervation to the Society.

Sir Robert Moray produced an odd kind of plant, ſaid to have grown at the bottom of a pond, and having ſtrings, that for a certain ſpace run pretty evenly diſtant from one another, but then meet in knots.

The operator produced the caſe of ſteel, with the gunpowder, opened, ſome of which gunpowder being taken out, and held on a piece of paper over the fire, gave no report at all, but flamed away without any noiſe; it being found calcined in the cavity, and turned into an alkali; and growing moiſt in the air, the nitrous part having been deſtroyed by ſome vent or other, without cracking the caſe made extraordinarily ſtrong.

It was ordered, that the like experiment ſhould be repeated, both with prince Rupert's and the fulminating powder, at the next meeting.

The dog, which had a piece of his ſkin cut off, being run away, it was ordered, that Dr. Wilkins and Dr. Charleton ſhould repeat the experiment by themſelves, to have the better care of the dog.

Sir Robert Moray moved, that the experiment of calcining antimony by the ſun, and thereby increaſing it by weight, according to the aſſertion of ſome chemiſts, might be made. And it was ordered, that Dr. Goddard be deſired to be curator of this experiment.

Mr. Southwell mentioned the art of pilchard-fiſhing in Ireland and other parts; and was deſired to procure the whole hiſtory of it.

Sir Robert Moray moving, that the like hiſtory of herring-fiſhing might be thought on, Mr. Evelyn obſerved, that one Mr. Smith had publiſhed a good diſcourſe upon that ſubject, containing all that was material in that practice.

Mr. Haak mentioning a way of ordering ling, ſo as to make it white, and yet eat very well, he was deſired to procure the account of it.

He intimating, that he had a friend in Helvetia, by whoſe means he could get ſome of the ſtrong perry made in that country, was deſired to procure ſome, together with the method of making and keeping it.

There were made ſeveral experiments more of breaking wood:

1. A piece of fir, of half an inch diameter, and three inches long, at which diſtance the weight hung, broke in the plain of the grain horizontally with ſixty-ſix pounds three quarters, whereof fifteen pounds Troy; vertically with two pounds more.

2. Fir, of a quarter of an inch diameter, and an inch and half long, broke vertically with twenty pounds, and horizontally with nineteen pounds.

3. Elm, of half an inch diameter, and three inches long, broken horizontally with forty-ſeven pounds, vertically with twenty-three pounds.

4. Elm, of a quarter of an inch diameter, and an inch and half long, broke horizontally with twelve pounds, vertically with ten pounds.

Sir Edward Harley moved, that the difference between cleft and ſawed wood might be tried this way.

Sir Robert Moray moved, that it might be examined, what truth there is in that received tradition, that the ſtainings of fruit will not waſh out the ſame year that they are made, but will the next ſpring, at the time of their bloſſoming; after which is paſt, they cannot then be waſhed out that year. Dr. Croune was deſired to be curator of this kind of experiments, by ſtaining linnen with all ſorts of ſtaining fruit, berries, wine, *&c.*

Mr. Hoskyns related, for the improvement of metals, that one Wethall had raiſed a great eſtate from the mines of Mendip, by melting the ore after a particular manner, for the extracting much more metal out of the ore than ordinarily is done. He was deſired to inquire farther after it.

The experiments appointed for the next day were thoſe of the celerity of falling bodies, and of the fulminating powder, or prince Rupert's powder, in the cylinder of ſteel; and of breaking more kinds of wood.

Mr. Hooke was deſired to think upon one or two experiments more for that meeting.

July 6. At the meeting of the Council were preſent,

The lord viſcount Brouncker, preſident.
Mr. Howard.
Sir Robert Moray.
Sir Peter Wyche.
Mr. Aerskine.
Dr. Goddard.
Mr. Palmer.
Mr. Colwall.
Mr. Hill.
Mr. Hoskyns.
Mr. Oldenburg.

Dr. Goddard and Mr. Palmer were put in mind to confer with Mr. Ellise concerning the ſtatutes of the Society.

Sir Robert Moray mentioned, that the attorney-general had not yet given his report concerning Chelſea-college.

It was ordered, that the Council ſhould not meet for the future, except upon ſummons to be ſent by the preſident to every member of the Council.

At the meeting of the Society on the ſame day,

An experiment was made to meaſure the velocity of a ſounding ſtring, or to determine how quick the vibrations thereof are in a certain ſpace of time. There was taken a braſs wire of 136 foot long, of $\frac{1}{72}$ of an inch diameter; and weighing this ſtring, extended by a weight of $3\frac{3}{4}$ lb. + 1 lb. 10 ounces, and being made to vibrate in the middle, its vibrations were found to be half ſeconds. Then being ſtopped in the middle, and the half of that made to vibrate in the middle, was found twice as ſwift, or to vibrate quarter ſeconds: whence the length and vibrations appeared reciprocal. And by meaſuring how much the line bent below a ſtrait line, it was found, that the diſtance was equal to the length of a pendulum, vibrating equal times with the ſtring; reckoning that length from the ſtrait line with the center of gravity of the parabolical ſtring. Then farther ſtopping the wire within one foot of the end, and ſtriking that ſhort part, it was gueſſed to give a note of *G. Sol. Re. Ut*; which was to be experimented by a pipe at the next meeting. So that it ſeemed, that the velocity of the vibration of a ſtring tuned to *G. Sol. Re Ut.* is two hundred ſeventy-two times in a ſecond.

This experiment, to ſhew how quick the vibrations muſt be to give a certain ſound, being made, it was tried with the ſame ſtring, with what velocity a ſound is propagated; and it was found, that there is no perceptible interval of time betwixt the ſtroke at one end of the ſtring, and the hearing the ſound at the other end. It was ordered, that the ſtring ſhould be lengthened, for the proſecuting of this experiment.

The obſervation of the variation of the needle was ordered to be made on the firſt fair day after Thurſday, in Whitehall-garden, at two in the afternoon, meeting at Sir ROBERT MORAY's lodgings.

Mr. HOWARD produced a plant, which he took to be the *Serpentaria Virginiana*, the antidote againſt rattle-ſnakes; but Dr. MERRET judged it to be ſaxifrage, as having the perfect taſte and ſmell thereof.

Capt SILAS TAYLOR related, that the Virginians, when they would kill rattle-ſnakes, take the plant called ditany of Virginia, and having tied ſome of it between a cleft ſtick, hold it to the ſnake to ſmell; who preſently coils herſelf up, keeping her head in the middle, and turning it away from the plant as much and as long as ſhe can: then after ſome few moments of time, ſhe opens herſelf on a ſudden, and being ſtretched out in length is found quite dead. This relation he affirmed to have received from one Mr. GREEN, a very credible perſon, from whom, and from others, if it might be, Capt TAYLOR was deſired to procure this ſtory under their hands, which he promiſed to endeavour to do.

Sir ROBERT MORAY produced a ſmall ſtone, in part of a bloody colour, given him by the lord privy-ſeal[1], and by him ſaid to be taken out of the walls of a church ſtanding upon the ſea at Pendennis, after the top and walls of that church, by thunder and lightning, were turned into this ruddy colour.

The experiments of breaking wood were proſecuted:

A piece of oak, of half an inch diameter, and three inches long, brake horizontally with forty-eight pounds, vertically with forty-ſix pounds.

Aſh, of half an inch diameter, and three inches long, horizontally with ſeventy-ſeven pounds, vertically with ſeventy-five pounds.

Aſh, of a quarter of an inch diameter, and an inch and half long, horizontally with nineteen pounds, vertically with twenty-three pounds.

Oak, of a quarter of an inch diameter, and an inch and half long, horizontally with fifteen pounds, vertically with twelve pounds.

It was ordered, to try the beſt part of oak, and likewiſe Dr. GODDARD's comparative way of breaking fir and elm, both direct and tranſverſe grains.

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[1] JOHN lord ROBERTES.

Capt. Taylor related, that he had known a Frenchman, who had a ſecret of tempering and hardening iron ſo that it would not ruſt, either by ſea-water, or vinegar, or urine; adding, that the ſteel of a gun, which he produced, had been put in ſalt water, and was not affected with any ruſt; and that the ſame gun had not been oiled ſince it had been made, *viz.* for three years, having been in the magazine of Dunkirk, where it had kept free from ruſt, when all other arms grew ruſty very often. He added farther, that the artiſt employed a certain water, which he concealed the ingredients of, wherein he quenched the iron eight or ten times, in order to reduce it to this condition.

Dr. Balle related, that in Exeter river there was found a kind of very black and heavy oak, which had lain there for ſeveral hundreds of years, cut down formerly to make the ſaid river uſeleſs to that city. He was deſired to ſend for ſome of this wood, and for ſome of the ordinary oak of that country, to try and compare their ſtrength.

Sir Robert Moray moved, that the wood of Hatfield-chace in Yorkſhire, having been buried there by a deluge, and the place afterwards drained, it might be inquired, what was become of that wood, and how it was altered by lying thus long under-ground. Dr. Charleton remarking, that Mr. Dugdale having given a good account of this place in his *Hiſtory of imbanking and draining of divers fens and marſhes, both in foreign parts and in this kingdom* [m], the amanuenſis was ordered to borrow that book of Mr. Martyn, for the uſe of the Society, againſt the next meeting.

Mr. Hooke being called upon to give an account of the flies found alive in the glaſs with the dead cantharides, produced at the preceding meeting, ſaid, that having looked upon them with a microſcope, he found them to be not young cantharides, but ordinary flies.

Sir Robert Moray mentioned, that Mr. Thomas Killegrew had aſſured him, that he had found a pot with viper-powder in it, brought from Venice, and cloſely ſtopped, full of little live inſects after the ſpace of ſix months.

Dr. Pell added, that he had known a chemiſt, who uſed to perfume his viper-powder with myrrh, to preſerve it from breeding worms.

Mr. Evelyn gave an account, how that the fleſh, which he had formerly, by order of the Society, put up in a glaſs, covered with double flannel, had bred no live creatures, but turned into a mucilage, and then dried up.

The experiment of common powder in the ſteel caſe was tried again in a ſtrong fire; but no report was heard except only a little hiſſing, nor any crack found in the veſſel.

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[m] Printed at London, 1662, in folio.

Sir **Robert Moray** was deſired to procure ſome of prince **Rupert**'s powder; and Mr. **Hooke** to bring ſome of his fulminating powder, to be tried in the ſteel caſe at the next meeting.

It was ordered, that the ſkin of a dog be cut off in Dr. **Wilkins**'s houſe, after his return; and that Dr. **Charleton** perform the operation.

Mr. **Hoskyns** deſired, that ſome phyſicians, upon occaſion, might be appointed to examine the truth of what **Kircher** affirmed, that little worms were found in the blood of peſtiferous perſons.

Dr. **Merret** related, that Dr. **Harvey** had ſometimes found the blood full of worms in malignant fevers.

Mr. **Evelyn** ſeconded this relation, by affirming, that Mademoiſelle **d'Orleans** being ſick of a fever, a vein being opened, her blood was full of little worms; Dr. **Davison** aſſuring him, that himſelf and ſeveral other phyſicians had ſeen it.

Dr. **Pell** mentioned, that **Van Helmont** had taken notice, that the ſtomachs of perſons dying of peſtilential or other malignant fevers had holes in them. Which was ſeconded by Dr. **Merret**, who added, that ſuch ſtomachs were found gangrened, having had violent vomitings preceding.

The experiments appointed for the next meeting were; 1. To proſecute the trials with the braſs wire. 2. To try the velocity of falling bodies with Mr. **Hooke**'s new inſtrument. 3. To proſecute the breaking of wood. 4. The anatomical experiment, by Dr. **Goddard**. 5. Mr. **Hooke**'s experiment with a glaſs-cane and glaſs bubbles in it.

July 13. The experiment of determining the velocity of the vibrations of a braſs wire, to afford a certain ſound, was proſecuted, and agreeing with what was made at the laſt meeting, order was given, that a monochord ſhould be prepared againſt the next meeting, to know the diverſity of notes by.

The experiment of the velocity of a ſound's being propagated was likewiſe repeated, and proſecuted by lengthening the wire to 272 feet; and it was found as before.

The experiment of meaſuring the celerity of falling bodies was tried; but the wind diſordering the ſtring, on which the ball hung, it was referred to the next meeting; order being given to prepare a board for the balls to fall upon without a ſtring; as alſo to try, beſides balls of lead, other bodies of the ſame magnitude and figure.

Sir **Robert Moray** made ſome report of the obſervation of the variation of the needle, *viz.* that much uncertainty was found in it, the needle ſtanding one time between 1° and one 1° 30′ weſtward, another time about 1° 30′ eaſtward;

but at laſt directly north and ſouth. It was ordered to repeat the obſervations as often as conveniently might be, and that Mr. Hooke ſhould bring in writing the whole apparatus and all the circumſtances of the obſervations.

Sir Robert Moray moved, that thoſe two magnetical experiments might be made, 1. Whether a needle might be ſo touched upon any magnet, as not to point to the true north or ſouth. 2. Whether different loadſtones would give different directions; and whether fainter or ſtronger touches upon one and the ſame ſtone would cauſe any variation in the directions. It was ordered, that for this purpoſe as many loadſtones, as could be had, ſhould be gotten, and a good number of needles exactly made of the ſame metal, bigneſs, and figure.

Sir Robert Moray moved likewiſe, that a magnet being found not to have ſo much virtue, when whole, as when broken into ſeveral pieces, an experiment might be made of breaking a loadſtone into many pieces, and comparing the aggregate of the weights lifted up by all the ſeveral pieces to the weight lifted up by the intire ſtone. It was ordered, that Mr. Balle have the care of making theſe experiments.

It was ſuggeſted by the preſident, that the cauſe of this phænomenon might be the largeneſs of the ſurface in ſuch broken pieces exceeding that of the whole.

Mr. Hooke mentioned, that he had ſeen a little loadſtone lift up 150 times its weight.

The experiment of firing gun-powder in a ſteel-caſe was tried again; but no report was heard, nor any thing broken in the veſſel.

Sir Paul Neile moved, that it being probable, that the gunpower might melt in the caſe by the gradual heat of the fire, and ſo make no report, a hole might be drilled in the ſcrew, and by that means the powder fired with a brimſtony thread.

Mr. Hooke moved, that the experiment might be made with fulminating powder.

It was ordered, that both theſe experiments ſhould be made, and that it ſhould likewiſe be tried, whether *aurum fulminans* and *pulvis fulminans* give a flame, when fired.

Mr. Dugdale's *Hiſtory of imbanking and draining of divers fens and marſhes* being produced, according to the order of the laſt meeting, and the place, for which it was produced, being read, it appeared from thence, that that fenny tract called the *Iſle of Axholme*, lying part in Lincolnſhire and part in Yorkſhire, extending as far as Hatfield Chaſe, had antiently been a woody country, as was evident from the abundance of oak, fir, and other trees, of late frequently found in the moor; whereof ſome oaks were five yards in compaſs, and ſixteen yards long; others ſmaller and longer; with good quantities of acorns near them, lying ſomewhat above three feet in depth, and near their roots, which ſtill ſtood as they grew, *viz.* in firm earth below the moor. The firs lay a foot or eighteen inches deeper, more in number, and many of them thirty yards long, one of them having been not many years before taken up of thirty-ſix yards long, beſides the top, lying alſo near the root, which ſtood likewiſe as it grew, having been burnt, and not cut down, as the oak had alſo been. The number of thoſe trees was repreſented by Mr. DUGDALE as ſo great, that the inhabitants had for divers years paſt taken up 2000 cart-loads in a year. Of the firſt time of the overflowing of this woody level Mr. DUGDALE could give no account; only that it had been ſo for divers hundred years, as, he obſerved, the depth of the moor evinced, which could not in a few ages grow to that thickneſs, which it was of. With regard to the cauſe of it, he concluded it to have been the muddineſs of the conſtant tides, which flowing up the Humber into the Trent, left in time ſo much filth as to obſtruct the currents of the Idle, Done, and other rivers, which thence flowed back, and overwhelmed that flat country.

July 20. Mr. BOYLE produced ſeveral kinds of iron ore out of one and the ſame mine, of which there was one ſort, that was particularly taken notice of for its looking not at all like ore, and yet being found, as Mr. BOYLE affirmed, the beſt of iron ore.

The experiment of dividing the braſs wire, to give muſical notes with a monochord, was made as follows: The braſs wires were extended upon a long ſquare box of four feet long, one with a weight, the other with a pin, till they became uniſons. Then the one being ſtopt in the middle with a moveable bridge, the two halves on either ſide were uniſons to one another, and one of them an eighth higher than the other, which was not ſtopt. The ſame was again divided with a bridge, ſo that the part on one ſide to that of the other was as one to two, and the ſhorter was an eighth higher than the longer, and the longer a fifth higher than the whole ſtring. Then the ſame was again ſo ſtopt, that the part on one ſide to that on the other was as one to four, and the ſecond was a double eighth higher, which is a fifteenth.

It was ordered, that this experiment be proſecuted at the next meeting by adding weights, to ſhew, what proportion weights have to ſounds.

Mr. BALLE produced ſeveral loadſtones, and amongſt them two terrella's, whereof one ſeemed to have four poles, with a circle paſſing between them, of no virtue at all. Some of the ſociety ſuggeſted, that it was probable, that this ſtone conſiſted of two ſtones by nature cemented together by a piece, which had no magnetical quality in it. The other terrella was bored in the middle for an iron pin to paſs through; wherein it was obſerved, that the iron pin being in it, the needle applied pointed not to the pole, but at ſome diſtance round about it; but the ſaid pin being taken out, the needle pointed juſt into the middle of the polar hole. Mr. BALLE being aſked, whether he had found, that theſe terrella's, by the roundneſs of their figures, had acquired more virtue than they had in other figures, anſwered in the negative.

It was ordered, that the former of theſe terrellas be armed on all the four poles, and then produced again before the ſociety.

Mr. BOYLE produced a book containing a relation of Iceland by Monſieur PEYRERE, a Frenchman; and was deſired to lend it to the ſecretary to peruſe it, and to give an account of it to the ſociety.

Dr. GODDARD gave an account of calcining antimony in the ſun with a burning-glaſs, *viz.* that he had found it ſo far from increaſing its weight, that the weight was decreaſed from twelve grains to between three and four.

Mr. BOYLE affirmed, that he had the like ſucceſs in ſuch an experiment; but that Monſieur LE FEBURE, who aſſerted the increaſe of antimony calcined by the ſun, hearing of the want of ſuch ſucceſs with him, anſwered, that it had not been calcined enough to reduce it to a fixed ſalt fit for the imbibing of air.

The operator produced ſome of the powder, that had been heated in the ſteel-caſe, and affirmed, that he had dried it, and carried it for ſome time in his pocket, where it was become moiſt.

Mr. BOYLE ſuggeſted, that the warm and moiſt ſteams iſſuing out of the operator's body, and tranſpiring into the powder in his pocket, might probably be the cauſe of the moiſtneſs.

Capt. TAYLOR produced an account in writing of the manner, related by him at the preceding meeting, of killing rattle-ſnakes by the ***Serpentaria Virginiana***, atteſted by two eye-witneſſes: which was ordered to be regiſtered[a].

He affirmed, that the water of this herb, taken inwardly by thoſe who were bitten by rattle-ſnakes, cured them perfectly.

Mr. BOYLE related ſome experiments made by himſelf with Tunbridge water, to find, whether the virtue of it was eaſily to be loſt, *viz.* that he had taken ſome freſh oak-leaves, torn them, and put them into ſome of that water, which thereby turned into a violet-colour in two minutes: but having kept ſome of that water for two or three days in a bottle ſtopt careleſsly, and put in likewiſe ſome of the above-mentioned leaves, he found no change in the colour at all.

Having made alſo an experiment of the weight of the ſaid water, he affirmed, that he found the difference of its weight from that of common water inconſiderable.

Notice being given, that ſome ſhips were ready for Guinea, it was deſired, that ſuch, as had inquiries to be made in thoſe parts, might prepare them againſt the next meeting.

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[a] Original Regiſter, vol. iii. p. 59. It is printed in the Philoſ. Tranſ. nº iii p. 43.

The experiments ordered for the next meeting were,

1. That of the celerity of deſcending bodies.
2. The proſecution of the experiment of braſs-wire to find out muſical notes.
3. Of breaking fir and elm.
4. Of meaſuring refractions by Mr. HOOKE's new inſtrument.
5. Of firing both gunpowder and fulminating powder.
6. Of trying, whether *aurum fulminans* and *pulvis fulminans* will flame, when fired.

July 27. At the meeting of the COUNCIL were preſent

The lord viſcount BROUNCKER,
 preſident.
Sir ROBERT MORAY.
Sir PAUL NEILE.
Mr. BOYLE.
Sir PETER WYCHE.

Mr. AERSKINE.
Dr. WILKINS.
Dr. GODDARD.
Mr. PALMER.
Mr. COLWALL.
Mr. OLDENBURG.

The preſident having moved, that it being probable, that the ſociety would get Chelſea College, Mr. SUTCLIFFE might be furniſhed with ten pounds more, in conſideration of his neceſſitous condition; it was ordered, that the ſaid ſum be paid to him by the treaſurer upon his acquittance.

It was reſolved, that ſeeing Dr. WILKINSON was ready to make a reſignation of his pretenſions to Chelſea College, that the ſaid reſignation ſhould be taken upon the terms inſiſted upon by him, *viz.* of his enjoying thirty pounds *per annum.* or ſomething equivalent to it, during his life, if it could not be obtained upon better terms.

It was ordered, that ſome perſons, who had been intruſted with the management of the buſineſs of the ſaid College, continue their care of the ſame, and take in the aſſiſtance of Mr. SMITH:

That at the firſt opportunity Mr. HOOKE be put to the ſcrutiny for the place of curator:

That he ſhould receive eighty pounds *per annum.* as curator to the ſociety by ſubſcriptions of particular members, or otherwiſe:

That he forthwith provide himſelf of a lodging in or near Greſham-College[*]: And

That theſe orders and votes be kept ſecret, till Sir JOHN CUTLER ſhall have eſtabliſhed Mr. HOOKE as profeſſor of the hiſtories of trades.

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[*] Mr. HOOKE accordingly ſettled in Greſham-College about the end of Auguſt or beggining of September 1664; for in a letter to Mr. BOYLE dated October 6, printed in Mr. BOYLE's Works, vol. v. p. 537. he takes notice, that he had been *full five weeks* ſettled there.

Mr. Palmer reported, that Mr. Ellise having been conſulted with concerning the ſtatutes of the ſociety, had declared to Dr. Goddard and himſelf, that they were ſuch both as to matter and form, that he found no exceptions at all againſt them, but muſt highly approve of them for the reaſon, convenience, and perſpicuity therein; wiſhing, that all other laws might equal them in theſe qualifications.

At the meeting of the Society on the ſame day,

The wooden caſe, containing the Eaſt-India preſent, ſent from Sir Philiberto Vernatti by Sir Robert Moray's procurement to the ſociety, was opened, and the particulars produced, according to the liſt accompanying them. The anſwers likewiſe returned by Sir Philiberto to certain inquiries formerly ſent thither by the ſociety, and recommended by Sir Robert Moray, were read, and ordered to be regiſtered[p]. Sir Robert Moray was alſo deſired to write a letter of thanks for this double preſent, and to take care, that an order be drawn up for moving the Eaſt-India company, by the favour of the lord Berkley, that they would pleaſe to recommend ſuch kind of inquiries to their correſpondents in the Eaſt-Indies, and take care of the conveyance of what ſhould be committed to them for the ſociety.

It was ordered, that the ſaid anſwers to the inquiries being regiſtered, ſhould be communicated to ſuch members of the ſociety, as were willing to take occaſion from thence to preſs for more particular anſwers upon theſe inquiries; ſuch, for inſtance, as, how the oil drawn out of the roots of a cinnamon-tree, and reſembling camphire, is extracted from thence? and what the birds are, which make the Cochinchina neſts, and of what materials they make them, *&c.*

It was likewiſe ordered, that new inquiries be brought in by thoſe, who could think on any, for the Eaſt-Indies: And

That Mr. Boyle and Mr. Hill bring in their inquiries for Guinea againſt the next meeting.

Mr. Boyle mentioned, that there was in England a plant ſomewhat like the *arbor triſtis* of the Eaſt-Indies, which blows about ſun ſet, and ſheds its bloſſoms in the morning, as ſoon as the weather grows to any degree warm.

He remarked likewiſe, that the yew-tree was miſchievous to horſes, there having been three horſes tied to ſuch a tree at the Wells, which eating of its leaves, two of them died within a few hours after, and the third recovered with much difficulty, after the uſe of ſeveral remedies.

This was ſeconded by Dr. Wallis, who affirmed, that the leaves of the ſaid tree being mingled with meat, and given to dogs, would certainly kill them.

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[p] Original Regiſter, vol. iii. p. 44. Theſe anſwers are printed in Sprat's Hiſtory of the Royal Society, p. 158.

Reflexion being made upon the wood, ſaid in the Eaſt-Indian account to ſmell like human excrement, it was remarked by Dr. Croune, that Riverius in his Obſervations mentioned, that in the time of a great plague at Montpellier, there were three perſons in one and the ſame houſe cured of that infection by giving themſelves a vomit made of their own dung and urine.

Mr. Palmer ſeconded this with a ſtory of the like cures performed at Genoa by the like remedy in as many perſons as made uſe of it.

Mr. Boyle acquainted the ſociety, that he had cauſed to be made a true meaſure of a cubic inch of water, thereby to eſtimate the bigneſs of bodies. He was deſired to communicate to the ſociety the performances, which he ſhould make with it.

The experiment of firing prince Rupert's powder in a caſe of ſteel was made. It was very cloſely ſcrewed up, and a very ſmall hole drilled in the ſide of it, thro' which, by the means of a train of touch-powder, fire was given to the included powder, which immediately diſcharged with a great noiſe and violence, and threw the caſe about four or five feet from the place where it lay, but did not break any part of it, nor widen the little hole, which was no bigger than to receive a ſmall pin. Yet upon examination of the whole, after the diſcharging of the powder, the little hole was found ſomewhat bigger than the drill, by which the operator affirmed he had made the ſame.

The experiment with *pulvis fulminans* was likewiſe made. A quantity of it was included in another ſteel caſe, and then ſet on fire, which after ſome time upon going off gave a dull hollow noiſe; but it neither broke the caſe, nor was there any appearance of flame or ſmoke.

Mr. Boyle propoſed, that it might be examined, what is really the expanſion of gunpowder, when fired.

The experiment with the monochord was proſecuted, and one wire being extended by five pounds weight, the other was tuned to an uniſon with it; and then the ſame ſtring being ſtretched with a weight of twenty pounds, it was found juſt an octave higher: which ſhews, that the weight is in a duplicate proportion to the ſound or vibration.

It was ordered, that this experiment be farther proſecuted at the next meeting; as alſo that of the celerity of falling bodies; and that *aurum fulminans* and *pulvis fulminans* be fired in a dark corner, to ſee, whether they would flame; and that the inſtrument for meaſuring refractions be prepared.

Auguſt 3. James Hoare, eſq; was propoſed candidate by Mr. Slingesby.

The experiment of the velocity of deſcending bodies was tried with three leaden balls of different ſizes; the diameter of one being $1\frac{73}{100}$ inch; of the ſecond, $1\frac{37}{100}$

inch; of the third, $\frac{99}{100}$ inch. The height of their deſcent was ſixty-one feet; the time three vibrations of half ſeconds and $15'''$ or $16'''$. So that the difference between them was but $1'''$.

Mr. Hooke was deſired to find ſome convenient place in Weſtminſter or Paul's for the proſecution of theſe experiments in a place free from wind; and to requeſt ſuch perſons of the ſociety for his aſſiſtance, as he could get.

The experiment of the monochord was proſecuted. Two ſtrings being tuned uniſons, one of them was ſtopt at one third, and the lower end of it gave a fifth, and the ſhorter end was an eighth higher than the longer. Then one of the ſtrings was ſo ſtopt, as to make it a note higher than the whole; and the proportion of the ſhorter to the whole was found leſs than 9 to 10. Then the ſtring was ſtopt a third higher, and the proportion was found as 3 to 4. This was eſtimated ſo by the ear.

Capt. Taylor was deſired to ſpeak to Mr. Birchensha to be preſent at the next meeting for the proſecution of theſe experiments.

The experiment of breaking fir and elm was made, and a piece of fir of one inch diameter at ſix inches diſtance from the weight was, with the grain tranſverſe, broken horizontally with fifteen pounds; vertically with twenty-three pounds. Elm of the like dimenſion at the like diſtance, with the grain tranſverſe, broken horizontally with thirty-two pounds at moſt; vertically with thirty-three pounds.

The operator gave an account, that the *pulvis fulminans* kept in the ſteel-caſe a whole week did, as ſoon as it had any vent by making the ſcrew a little eaſy, give a ſtrong blaſt and a ſmoke. Freſh powder being taken, and put upon an iron-plate over ſome coals, fired after a little while, with a very ſmart report.

This experiment with the *pulvis fulminans* was ordered to be repeated at the next meeting.

The preſident produced from Sir William Curtius a hairy ball found in the belly of a cow.

Mr. Oldenburg produced ſome ores and mineral earths ſent to him from Germany, to the number of ſeventeen particulars, which he deſired to leave in the repoſitory of the ſociety, who accepted of them.

Mr. Hill's queries for Guinea were read, and Dr. Wilkins was deſired to deduce others out of them, and to add more.

It was ordered, that the committee for correſpondence conſider of drawing up both general and particular heads of inquiries for all the parts of the world.

Dr. Wilkins brought from Dr. Worthington a bundle of letters written by Mr. Horrox to Mr. Crabtree concerning aſtronomical matters. It was ordered, that the ſecretary ſend them to Dr. Wallis to peruſe them, and extract out of them what he ſhould think fit to be digeſted and publiſhed with the other written pieces, which he had already in his hands, of the ſame author.

The order for recommending inquiries to the Eaſt-Indies was brought in by the ſecretary, and approved of, as follows:

Ordered, That Dr. Wilkins be deſired to ſpeak to the lord Berkley, that he would pleaſe, in the name of the Royal Society, to move the committee of the company for the Eaſt-Indies, that, by their intereſt in theſe parts, they would procure ſuch anſwers, as may ſatiſfy the inquiries to be ſent to them; as alſo ſuch particulars of the productions and curioſities of nature, as ſhall be ſpecified unto them, and ſuch others, as thoſe parts do afford, and they by their induſtry can inquire, for the uſe of the ſaid ſociety. Moreover, to write to their correſpondents at Bantam, to take a ſpecial care of the tranſport of ſuch things, as ſhall be tranſmitted and recommended to them by Sir Philiberto Vernatti for the uſe of the ſaid ſociety, and to pay there what may be demanded for them: which expences the ſaid ſociety will be careful to repay upon demand.

The experiments appointed for the next meeting were, 1. The proſecution of ſounds with the monichord. 2. The meaſuring of refractions. 3. The deſcent of bodies. 4. The *pulvis fulminans*.

Auguſt 10. At the meeting of the Council were preſent

The lord viſcount Brouncker,
preſident.
Sir Robert Moray.
Sir Peter Wyche.
Mr. Aerskine.
Dr. Wilkins.
Dr. Goddard.
Dr. Merret.
Mr. Oldenburg.

The form of the king's and the duke of York's ſubſcriptions was referred to the committee, that met on Mondays at Dr. Goddard's lodgings.

At the meeting of the Society on the ſame day,

The ſecretary preſented the ſociety from Mr. Beal with a box full of ſeveral ſorts of ſtones, by which the latter conceived it might be ſeen what is the proceſs of the plaſtic ſpirit in ſhaping perfect cockles, muſcles, ſcollops, headleſs ſerpents, fiſhes, thunder-ſtones, *&c.* But ſeveral members were of opinion, that theſe ſhells had been filled with clay or mud, which from them received the impreſſion of their figure, and was in length of time hardened into a ſtony ſubſtance; ſeeing that in ſome of theſe ſtones the ſhells were yet manifeſtly diſtinct from the petrified earth, though in others both earth and ſhell had been converted into ſtone together. There was begun to be read Mr. Beal's annexed diſcourſe relating to theſe ſtones, the reſt being referred to another meeting, becauſe Mr. Birchinsha was without, expecting to be called in, for the proſecution of the experiments with the monochord, according to the order of the preceding meeting.

Mr. Birchinsha being accordingly called in, tuned the ſtring by his ear, to find how near the practice of muſic agreed with the theory of proportions. The effect was, that he could not by his ear diſtinguiſh any difference of ſounds (upon the moving of the bridge) above half an inch, eſpecially in the fourths, thirds, and tones. Whereupon it was reſolved, that a virginal ſhould be as exactly tuned, as could be done by the ear, and then the monochord examined by it.

Mr. Povey being deſired to name a day for the committee of correſpondence to meet, moved the third Friday of every month, about three of the clock in the afternoon, at his houſe in Lincoln's-inn-fields.

He was requeſted to procure for the ſociety a collection of all ſorts of curious woods, minerals, and petrified ſubſtances; which he promiſed to do.

He likewiſe offered to bring in from his brother lately come from Jamaica, and admitted to be preſent at this meeting, ſeveral ſorts of ſhells found in mines with minerals in them.

Dr. Goddard moved, that among the inquiries *de novo* to be ſent to the Eaſt-Indies, it might be carefully inquired after, whether that wood, which lately came from thence, having the ſmell of human excrement, did really grow ſo.

He and Dr. Merret were deſired to bring in a liſt, of what other particulars of natural things, ſuppoſed to be in the Eaſt-Indies, inquiry ſhould be farther made.

Mr. Povey was deſired to conſider how woods might be improved for dying.

It was ordered, that the way of fixing colours ſhould be recommended to Mr. Howard, Mr. Boyle, and Dr. Merret. And that the gun, which Mr. Palmer gave to the ſociety, ſhould be lent to Dr. Charleton for a month.

Dr. Charleton informed the ſociety, that he had a way of keeping a gun from ruſting for a year by cleanſing it with oil, whence the ſalt was ſeparated, which, he ſaid, might eaſily be done by boiling the oil in warm water; whereupon the ſalt would part from it: and if then the touch-hole was ſtopt with a quill, and the other holes with cork, and the gun kept in a caſe, it would not eaſily ruſt.

Sir Robert Moray acquainted the ſociety with a letter of Monſieur Huygens, written to himſelf, containing philoſophical matters; which was ordered to be read at the next meeting.

Mr. Packer brought in the account of mine-damps, which was alſo ordered to be read at the next meeting.

The experiments appointed for the next meeting were,

1. Meaſuring of refractions.

2. Velocity of falling bodies.

3. The flaming of *aurum fulminans* and *pulvis fulminans.*

Mr. Hooke was deſired to bring a liſt of experiments to be made before the ſociety on their meeting-days.

Auguſt 17. The engine to meaſure refractions was produced, examined, and approved of, and Mr. Hooke, the inventor of it, appointed to begin at the next meeting to try experiments in it; as alſo to give a deſcription of this engine, to be kept in the Regiſter-book.

Dr. Goddard brought in writing ſome obſervations upon the experiments formerly made of ſeveral liquors in a tube of about thirty-ſix feet in length, erected perpendicularly: which was ordered to be regiſtered [q], as follow:

“ Being filled with ſimple water, cloſed near the upper end, and opened below,
“ half a minute after, in the fourth repetition of the experiment, the water ſettled
“ within the glaſs-tube at 33 feet $3\frac{1}{4}$ inches perpendicularly from the level of the
“ water in the veſſel wherein the lower end of the tube was immerſed.

“ Trial was made in two other liquors, the one lighter the other heavier than
“ ſimple water; ſpirit of wine and brine, or ſimple water impregnated with as
“ much ſalt as it would diſſolve; which in the ſame meaſure we found differing
“ in weight, as followeth:

	℥.	ʒ.	*gr.*
“ The weight of the ſpirit of wine - - -	8	8	0
the ſimple water - - -	8	15	15
the brine - - - - -	10	0	15

“ The tube being filled with ſpirit of wine, ſtopped above and opened below
“ about half a minute after, the liquor ſettled about thirteen or fourteen inches
“ higher than the mark of the water. And this experiment being repeated three
“ or four times, there was little ſenſible difference in the height.

“ Being filled with brine, the liquor deſcended ſuddenly above two foot below
“ the mark of the water, and ſoon after below any part of the glaſs-tube; how
“ far, could not be judged, becauſe it was out of ſight.”

Dr. Goddard was deſired to deſcribe his inſtrument with ſtrings and pullies intended for a hygroſcope, and to take notice of the uſeleſſneſs thereof, as it had been hitherto contrived, and to think upon another way fitter for ſucceſs.

A paper of Mr. Packer's concerning damps in mines was read, and ordered to be filed up; and he was deſired to inquire of the perſon, who had ſent him this account, how many ſhafts there are in that mine, wherein the paper mentioned a great and fiercely burning coal-fire to have been extinguiſhed in the pit's mouth, when it had drawn the damp up the ſhaft.

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[q] Original Regiſter, vol. iii. p. 60.

Monſieur Huygens's letter to Sir Robert Moray was read, dated at the Hague Auguſt 8, 1664, N. S.[r] containing ſeveral philoſophical matters; as of his new pendulum watch, which might probably ſerve for the obſervation of longitude: of his reflections upon the ſociety's experiments concerning the velocity of braſs-wires, and upon thoſe, that riſe on the diviſion of a monochord: of thoſe made by Mr. Hooke's inſtrument for meaſuring the deſcent of falling bodies: of the magnet with four poles, Dr. Willis's *Anatome Cerebri*, a new chariot, and a teleſcope of ſixty feet.

Sir Robert Moray moved, that for the trial of the vibrations of hard bodies ſounding, there might be made a flat round plate of bell-metal, with a hole drilled in the middle, through which a cord might be drawn to hang it by; and to have ſeveral of theſe round plates made of different ſizes, to ſee, what difference of ſounds they would make, their edges being ſtruck upon.

Capt. Taylor offered from Mr. Birchensha the fitting of a double baſe-viol with gut-ſtrings in ſuch a manner, that being divided they ſhould ſerve better to diſtinguiſh the muſical notes by the ear than the wire-ſtrings do. The offer was accepted, and Mr. Birchensha was deſired by Capt. Taylor to be curator of the experiment.

Sir Robert Moray moved, that a loadſtone, the poles of which were known, might be cut into a crooked figure, to ſee what it would produce in the poles. This was referred to the mechanical committee.

Mr. Hooke made report, that a leaden ball deſcending fell in the firſt ſecond of time of fall 15½ feet, being tried by him ſeveral times; and that the deſcent holds in a duplicate proportion. It was ordered, that this experiment ſhould be carefully proſecuted by him with balls of ſeveral ſizes and different materials, and in particular with bodies of a cylindrical figure.

It was ordered, that the experiments of breaking ſeveral ſorts of wood be proſecuted by Mr. Hooke; and that they ſhould be made upon the ſame kinds of wood of ſeveral ages, grown in ſeveral places, and cut at different ſeaſons of the year.

Mr. Wylde was deſired to ſhew the ſociety an experiment of his way of ſoftening ſteel without fire, and hardening it again; which he promiſed to do, and to give the proceſs of performing it.

The experiments appointed for the next meeting were,

1. Of refractions.
2. Of the velocity of bodies ſhot by guns or bows.

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[r] Letter-book, vol. i. p. 178.

3. Of firing *aurum fulminans* and *pulvis fulminans* in a darkened room, to ſee, whether they flame.

Auguſt 24. There was made an experiment for finding the velocity of a bullet by means of the inſtrument for meaſuring the time of falling bodies; which was ſo contrived, that the pendulum was ſet on moving by the bullet's paſſing out of the mouth of the carabin, and a board was put up for a mark at a determinate diſtance, and a ſtring extended from that board to the pendulum, which was fixed juſt by the gun. It was thought, that by means of that ſtring, which was ſtrecht pretty ſtiff, and ſo contrived, that a ſmall thruſt againſt the board would ſtop the pendulum, the impulſe of the bullet againſt that board would be preſently communicated back to the pendulum, by which means that vibrating body being ſtopt at the very inſtant, would have ſhewn the time, that the bullet was paſſing from the mouth of the piece to the board or mark. But it was found upon ſeveral trials, that the bullet pierced through the board, which was three inches thick, and did not break a ſmall ſlender piece of white thread, which was to have ſtopt the pendulum.

It was ordered, that Mr. HOOKE ſhould conſider of a better way to try this experiment againſt the next meeting: And

That Dr. CHARLETON and Mr. HOOKE be curators for finding the velocity of ſounds with ſmall and great guns, with and againſt the wind.

Mr. HOOKE reported to the ſociety, that he had begun to make experiments upon the top of St. Paul's ſteeple for meaſuring the time of the vibrations of ſuch a pendulum, as reached from the ſaid top down to the floor of the church, which was above 200 feet; and that he had found, that a weight of four pounds being hung on a ſtring of the bigneſs of a crow's quill, about ¼ of the pendulum remained ſteady, the reſt making a ſingle vibration in 6″[a].

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[a] Mr. HOOKE's own account of theſe experiments in a letter to Mr. BOYLE, dated Auguſt 25, 1664, and printed among Mr. BOYLE's Works, vol. v. p. 534, is as follows: "I have ſince your departure been on the top of Paul's ſteeple, in order to make ſeveral experiments, which will be proſecuted this week. But it being the firſt time I had been there, I could not be ſo well provided with an apparatus as I found was requiſite, and therefore I was fain to return with only making ſome obſervations. One was, that a pendulum of the length of one hundred and eighty foot did perform each ſingle vibration in no leſs time than ſix whole ſeconds; ſo that in a turn and return of the pendulum, the half-ſecond pendulum was ſeveral times obſerved to give twenty-four ſtrokes or vibrations. Another was, that this long pendulum would ſometimes vibrate very ſtrangely, which was thus: The greateſt part of the line, by gueſs about ſix ſcore foot of the upper part of it, would hang directly perpendicular, and only the lower part vibrate; at what time the vibrations would be much quicker, and this though there was a weight of lead hung at the end of the ſtring of above four pound weight. In another place of the Tower, where I had very clear perpendicular deſcent, I with the plumb-line found the perpendicular hight of it two hundred and four feet very near, which is about ſixty feet higher than it was uſually reported to be. In which place I ſhall, with ſome other company, this week try the velocity of the deſcent of falling bodies, the Torricellian experiment, and ſeveral experiments about pendulums and weighing."

It was ordered, that this experiment be repeated; and the Torricellian experiment, together with that of weighing, and of the celerity of deſcending bodies, be likewiſe made in the ſame place.

Dr. Wilkins read a letter from Dr. Pope out of Italy of Auguſt 1, 1664, N. S. relating a ſtory of a terrible ſtorm of thunder and lightning, accompanied with hail of the ſize of great turky-eggs and tennis-balls; which was ordered to be entered[1], as follows:

"In this I ſhall give you an account of a mighty ſtorm, which being a piece "of natural hiſtory, I hope may be both acceptable to you, and yield matter of "diſcourſes to the virtuoſos of Greſham-College. Wedneſday July 29, S. N. "about three of the clock in the afternoon, Mr. Evelyn, two other Engliſh gentlemen, and myſelf, being in the way between Venice and Padoua, met with "ſuch a violent ſtorm of thunder, rain, and hail, as we had never ſeen, or ſcarce "heard of before. It was a thunder ſhower, and did, as they ordinarily do, "come againſt the wind with ſuch impetuoſity, that our horſes frighted broke "their harneſs, and ran away; our coachman came trembling into the coach to "ſave his life. A coach, a little behind us, ran into the river. After the ſtorm "was over, we ſaved one of the horſes, the other was drowned. The thunder "ſeemed greater and more terrible than in England; the rain ſo vehement, that "almoſt in an inſtant you might have rowed upon the ways with a gondola; but "the hail was moſt obſervable, much of it being as big as the biggeſt turky-"eggs; millions of them of the greatneſs of tennis-balls; all of them very ſolid "ice, ſo hard, that I could ſcarce find any I could break with my teeth. The "greateſt of them were of an oval figure, or rather more acute and turbinous "towards the ends. The ſecond rate were globes compreſſed, and ſeemed moſt "of them to have rays proceeding from the center, not unlike the ſexangular "ſnow. The third ſort, and of which there were the greateſt number, were perfectly round, of the bigneſs of tennis-balls. They fell with that force, that "they broke through the top of the coach in eight places, always through the "leather, ſometimes through the other linery too; they, that ſat on that ſide of "the coach, on which the ſtorm had ſome power (for it came not full againſt us) "were all black and blue in their arms and ſides, as if beaten with cudgels: had "not the top of the coach fenced us, we might have been in ſome danger. It "broke the boughs of the trees (ſeveral of which I ſaw bigger than my wriſt) and "ſtrewed the high way every where ſo thick with them, as if it had been for a "proceſſion. It has done much hurt to the trees, fruit, corn; in breaking the "tiles and glaſs-windows, which this part of Italy only is furniſhed with. I hear "not of any men killed; I ſuppoſe the thunder gave them warning, and leiſure "to retire to ſhelter. It began at the bottom of the Euganean hills, about ſix "miles from Padoua, went to Venice, we know not how much further, but ſuppoſe it ſpent itſelf in the gulf; the length was more than thirty, the breadth "about ſix miles. They tell incredible ſtories of the weight of hailſtones taken up "in the country, but I ſhall mingle no hearſays with this true relation."

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[1] Letter-book, vol. i. p. 176.

This ſtory was confirmed by Mr. Palmer, from a letter of Mr. Hammond's.

There was read a paper of Mr. Hooke's concerning petrifications, deſigned by him as a part of his microſcopical book, then in the preſs. The Society approved of the modeſty uſed in his aſſertions, but adviſed him to omit what he had delivered concerning the ends of ſuch petrifications.

Sir Paul Neile moved, that a copy of the ſucceſs of the experiment concerning the powder fired in a ſteel-caſe, after the way intimated by Col. Long, might be communicated to him. It was ordered, that the amanuenſis ſhonld make a copy againſt the next meeting; as alſo, that the experiment ſhould be made again at the ſame time.

Mr. Howard was deſired to expedite the deſcription of the hiſtory of tanning; and likewiſe of the way of making a kind of ſilk out of flax.

Dr. Wilkins mentioned, that Mr. Hooke having a way to diſcover a ſecond-minute of time by a ſun-dial or the ſtars, to be performed by a certain inſtrument, which diſcovery he looked upon as greatly conducing to the finding of the univerſal meaſure; it was ordered, that the inſtrument ſhould be made for that purpoſe.

The experiment of firing the *pulvis fulminans* being deſired to be made, it was deferred till the next meeting; as alſo, thoſe of meaſuring refractions.

Auguſt 31. At a meeting of the Council were preſent,

The lord viſcount Brouncker,
preſident.
Sir Robert Moray.
Sir Peter Wyche.
Mr. Aerskine.
Dr. Wilkins.
Dr. Goddard.
Mr. Palmer.
Mr. Colwall.
Mr. Hill.
Mr. Oldenburg.

It was reſolved, that the patent for the ſeveral new-faſhioned chariots be drawn for Mr. Hooke and his aſſiſtants.

At the meeting of the Society on the ſame day,

The experiment of meaſuring the refraction of common water was made with the new inſtrument prepared for that purpoſe; and the angle of inclination being 40 degrees, the angle of refraction was at firſt, when the hollow cylinder of the engine was not filled up to the wire, 14 degrees; but when the ſame was ſo filled, that it juſt covered the wire, it was 20.

It was ordered, that this experiment with common water be proſecuted, to ſee how it agreed with what had been of the ſame kind experimented by others; and that it be done at the ſeveral degrees of inclination from the perpendicular, and with ſeveral depths of waters: and that it ſhould be tried afterwards with other liquors.

Sir ROBERT MORAY gave an account of the experiment again made on St. PAUL's ſteeple, with a pendulum of 200 foot long, with an appendant weight of 14 pounds, *viz.* that it made two vibrations in 15″[u].

He produced a letter of Monſ. HUYGENS, dated at the Hague, 29 Aug. 1664, N. S.[w] mentioning an inſtrument deviſed by him for meaſuring the velocity of deſcending bodies (which was found not much different from that of Mr. HOOKE, invented before) as alſo, a new obſervation concerning Saturn, made the laſt ſpring at Rome, by one CAMPANI, *viz.* that the circle of Saturn had covered a part of its ſphere above, and had been covered thereby below, even with a little ſhadow upon the circle below, and upon the ſphere above: which obſervation Monſ. HUYGENS looked upon as confirming his ſyſtem, and to which himſelf had made one like it. It was alſo remarked in the ſame letter, that the ſaid obſerver at Rome pretended to have a new way of making optic-glaſſes by the means of a turne, without making uſe of a mold.

Dr. CLARKE gave an account of a Scotſman, who had, with a blow of a coult-ſtaff upon the ſide of his head, the ſkull broken under the temporal muſcle, by which the ſurgeons were forced to make an inciſion through the ſaid muſcle, according to the rectitude of the fibres; where afterwards, applying the trepan, the very bone, on which the trepan was ſet, came out, with a great many more pieces of bone from each ſide of it, to the breadth of the palm of a man's hand; ſo that that very part of the bone, to which the temporal muſcle uſed to be affixed, was altogether loſt; yet the man perfectly recovered, performing the functions of eating, talking, *&c.* as well as ever he did in his life.

A poor man alſo preſented himſelf, who had formerly received a ſhot into his belly, breaking his guts in two: whereupon one end of the colon ſtood out at the left ſide of his belly, whereby he voided all his excrements.

There was again tried the firing of prince RUPERT's powder in the ſteel-caſe cloſely ſcrewed up, with a ſmall hold drilled in the ſide of it, thereby to give fire with ſome touch-powder; but it would not go off, the hole being too little.

It was ordered to try it again the next day, with ſomewhat a larger hole.

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[u] Mr. OLDENBURG, in a letter written from London, Sept. 1, 1664, to Mr. BOYLE, and printed in the 5th volume, p. 306, 307, of the works of the latter, mentions, that on the Monday preceding, " a club of our philoſophers went to PAUL's, " to make experiments of falling bodies and of " pendulums. There were Sir ROBERT MORAY, " Dr. WILKINS, Dr. GODDARD, Mr. PALMER, " Mr. HILL, Mr. HOOKE; and ſome of them " went to the top of the ſteeple, and let down a " pendulum of 200 feet long, with an appendant " weight of pounds, and found two vibrations " thereof made in 15″. Time would not then " give leave to proceed to the other experiments, " that were deſigned, among which will alſo be " the Torricellian; but they will be ſet upon " within two or three days."

[w] Letter-book, vol. i. p. 183.

There was alſo made an experiment of the velocity of bodies deſcending in common water; and it was found, that ſmall-ſhot, in a narrow glaſs-cane of 81 inches long, fell to the bottom in two ſeconds and a little more.

It was ordered, that this kind of experiments ſhould be proſecuted, and firſt with bigger leaden bullets in a bigger veſſel: And

That the experiment for finding the velocity of a bullet, to be made at the next meeting.

September 7. The experiments of the velocity of bodies deſcending in water were proſecuted with balls of wax of ſeveral ſizes; and it appeared, that in a glaſs-cane of 81 inches long, the leſſer balls deſcended with an equal velocity, but the larger with an unequal.

It was ordered, to proſecute theſe experiments in a larger veſſel, and to prepare that of Dr. GODDARD for it againſt the next meeting.

The experiment of firing prince RUPERT's powder in the ſteel-caſe was tried again, the holes formerly made in the caſe being ſtopped up; and it was found, that the powder kept a hiſſing for a pretty while before it went off, and then made a report, without any breach of the piece, but only opened all the holes, which had been ſtopped up. It was ordered, that theſe holes ſhould be ſcrewed up for another experiment, and the touch-hole made ſomewhat greater.

The preſident gave an account, that he had tried the flaming of the *pulvis fulminans*, and found, that it flames before it goes off, being put upon a heated iron-plate. He was deſired to try it again, by putting the powder into a ſilver ſpoon, and ſo placing it upon the heated iron.

It was ordered, that Dr. CHARLETON and Mr. HOOKE meet the Saturday following in the afternoon, to try the velocity of a bullet ſhot out of a gun.

Mr. HOOKE gave an account, that the mercury in the Torricellian experiment made at St. PAUL's was on the top of the ſteeple fallen about half an inch beneath the ſtation thereof at the bottom of the church [x]. It was ordered to be proſecuted on the Tueſday following, about nine in the morning.

He related, that he had found the ſtars in Orion's-belt, which Monſ. HUYGENS made but three, to be five.

It was ordered, that he having a thirty-ſix foot glaſs, a tube ſhould be made for it, upon the account of the Society, to make celeſtial obſervations with.

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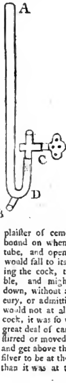
[x] Mr. HOOKE gives the following account of this experiment in a letter to Mr. BOYLE, dated Thurſday, Sept. 8, 1664, printed in Mr. BOYLE's works, vol. v. p. 535. "As for the experiments, "that I gave you an account of, that I intended "to proſecute on the top of St. PAUL's, I have, "by reaſon of ſome miſcarriages, only proceeded thus far, that drawing up a mercurial tube,

He was put in mind to prepare his inſtrument for meaſuring ſeconds of time by the ſun or ſtars.

It was ordered, that the ſecretary write to Mr. BOYLE, Dr. WALLIS, and Dr. WREN at Oxford, to get ready an apparatus for obſerving the conjunction of Mercury with the ſun, calculated by aſtronomers to be on the 25th of October next.

September 14. An account was given by the preſident, of ſome experiments made on the top of St. PAUL's ſteeple: 1. To meaſure the vibration of a pendulum of 200 feet long, which was found to vibrate thirteen times in 100″, the excurſion being about 12 feet; and when the excurſion was but 1 foot, or thereabouts, there wanted in theſe thirteen vibrations about 1″ or 2″ in 100″. 2. To diſcover the difference of the weight of bodies on the top of the ſteeple and below, where an iron, and cord ſufficient to reach from the top to the bottom, being counterpoiſed with fifteen pounds Troy, and brought to an equilibrium, and the



"made, after the form and ordered according to the manner here deſcribed: A B, a glaſs-pipe, about three feet long, whoſe end A was cloſed, and the other open at C, and bended in the manner of a ſyphon, as appears in the figure: Into C was cemented a ſmall ſtop-cock, to open and ſhut at pleaſure; and juſt in the bending of the pipe was drawn a ſmall hole B, by which the whole inſtrument, when the cock was ſtopped, was filled carefully top full with quickſilver: and then the hole was very well ſtopped with a ſmall plaiſter of cement, ſpread on leather, and bound on when hot. Then by inverting the tube, and opening the cock, the quickſilver would fall to its uſual ſtation. Then by turning the cock, this inſtrument became portable, and might eaſily be carried up and down, without any danger of loſing the mercury, or admitting any air: for the mercury would not at all vibrate, which, without the cock, it was ſo very apt to do, that without a great deal of care and trouble, it could not be ſtirred or moved, but the air would break in and get above the mercury. I found the quickſilver to be at the top full half an inch lower than it was at the bottom. The manner of making which experiment was thus: The ſteeple being without any kind of lofts, but having only here and there ſome rotten pieces of timber lying acroſs it, I cauſed a rope to be ſtretched quite croſs the top, and faſtened; in the midſt of which I fixed a pulley, through which I let down the ſtring and weight to the bottom (for only in the very middle of the ſteeple was there a broad clear paſſage from top to bottom) and to this I could not at the top approach within eighteen foot. Having thus let down the rope, thoſe that were at the bottom hung on this mercurial tube (which I had already marked and ſtopped, and ſet ready before I went up) a large weather-glaſs (which moved by the rarefaction and condenſation of the air only, which I had likewiſe marked and ſtopped) and a ſealed thermometer, which I had likewiſe marked. After theſe were drawn up, and by the contrivance of another pulley I had drawn them to me, I found the thermometer, the glaſs being but thin, broken. The quickſilver, upon opening the cock, I found to fall very conſiderably; which ſince, upon meaſuring, I find $\frac{3}{4}$ of an inch. The weather-glaſs I found to be riſen ſomewhat more than two inches. Then cloſing them again, I cauſed them to be let down; and giving them charge not to let it quite down till I called to them from below, I went down myſelf, and found, upon opening the mercurial tube, that it roſe exactly to its firſt ſtation; as did alſo the weather-glaſs. I had deſigned to have tried many others then, but the night came ſo faſt, that I could hardly ſee to get up again, and give order for the clearing of the lines. But I deſign, within a day or two, to make ſeveral other experiments."

iron being let down by the cord, the weight above preponderated the weight below by a drachm. 3. The third experiment was a repetition of the Torricellian experiment, where the mercury was found, as before, to ſubſide on the top of the ſteeple, about half an inch beneath its ſtandard below [y].

The experiment of meaſuring the velocity of falling bodies could not be made, becauſe the inſtrument for meaſuring broke. It was therefore ordered to try it another time, as alſo to repeat the experiment of weighing bodies above and below, by trying it with a ſingle weight on a wire.

It was ordered, that prince RUPERT be deſired by Sir ROBERT MORAY to try in his expedition to Guinea the ſounding of depths without a line, and the fetching up of water from the bottom of the ſea; and that for this purpoſe a dozen of leaden balls with a couple of wooden balls, as alſo the water-fetching veſſel, be prepared by the operator.

It was ordered likewiſe, that Mr. HOOKE ſhould contrive a pendulum clock applicable to the obſerving of the changes of the weather, as well and as cheap as he could, for the uſe of the ſociety.

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[y] Mr. HOOKE gave Mr. BOYLE the following account of theſe experiments in a letter to him dated from Greſham College September 15, 1664. and printed in Mr. BOYLE's Works, vol. v. p. 536. "As for the experiments on Paul's, I have, ſince my laſt, made ſeveral trials, which I ſuppoſe will not be unwelcome to you. Upon Tueſday the lord BROUNCKER, Sir ROBERT MORAY, and myſelf, were again at the ſame place, and examined the vibrations of a pendulum of 200 feet long. The line was a treble hard twiſt, one about the bigneſs of a very ſmall gooſe-quill; the weight of it was ſomewhat more than half a pound. At the lower end of this was hung a weight of lead of 28 pounds averdupois. This we found, when each vibration was about 12 or 14 foot, to make one ſingle vibration in 7 ſeconds and almoſt an half; that is, we found it to make 13 vibrations in 100 ſeconds pretty exactly. This we repeated ſeveral times, and found the ſame. Then we ſuffered it to vibrate not above a foot, and we found them ſomewhat quicker; that is, 13 vibrations in 98 ſeconds. After this we tried the ſame experiment with a ſmall wire about a 32d part of an inch in diameter, to which we hung the ſame weight, and found the vibrations very much the ſame, but ſomewhat ſwifter and longer. This we tried both with longer and ſhorter vibrations, and found them to correſpond with the former. On Wedneſday we made farther trials at the ſame place, and that was with a very curious beam we brought two weights to an equilibrium at the top of the Tower; the one was a 15 pound weight of braſs; the other, that counterpoiſed it, was a company of ſmaller braſs-weights tied in a ſmall canvaſs bag together with the former ſmall line; by which, after we had hung the beam over the very middle of the ſteeple, we let down the bag of weights to the bottom, and with long adjuſting we found, that the counterpoiſing bag and ſtring was grown lighter by a drachm. And this was very obſervable, that though the weight hung at that diſtance, and though, by ſome miſfortune, the cock of the beam was miſſing, yet was the beam ſo tender, that a very ſmall weight, as ſome very few grains, would ſenſibly turn it, and when brought to an equilibrium, the beam would vibrate, as if it had only a pair of ſhort ſcales hanging to it. The cauſe of this phænomenon, *viz.* why the bag, that was let to the bottom, was found lighter, was judged to proceed from the denſity of the air at the bottom, which, I acquainted you with, as I think, in the laſt letter. But we repeated the Torricellian experiment ſince, and found the difference ſome very ſmall matter leſs than half an inch. But our weather-glaſſes again failed us; as did alſo our inſtrument for the velocity of falling bodies. Yet ſome we made, but thoſe ſo imperfect, that I ſhall not, till we make them more accurate, trouble you with an account of them."

He was again put in mind to have ready his inſtrument for diſcovering ſecond minutes by the ſun, *&c.*

The order for having caſt a flat round plate of bell-metal to try the vibrations of hard bodies ſounding, being renewed, it was moved by Dr. GODDARD, that this plate might be hung both by the middle and the limb.

There was tried again the experiment of breaking a caſe of iron with prince RUPERT's powder; and the caſe having its ſides three quarters of an inch thick, and containing ſix penny-weight of the ſaid powder, broke with a very ſmart report in three pieces [z].

This experiment was ordered to be repeated at the next meeting in the like veſſel with four or five penny-weight.

The great ſquare veſſel for the trial of deſcending bodies in water was likewiſe ordered to be prepared.

September 21. There was read a Latin letter of Monſieur HEVELIUS to Mr. OLDENBURG the ſecretary, dated at Dantzick September 10, 1664, N. S. [a] giving the Society thanks for the honour, which they had done him in electing him into their body; and containing ſeveral particulars concerning his labours in obſerving the fixed ſtars, the angle of the orbit of Mercury, and the ecliptic; Dr. WREN's teleſcopical moon, the obſervation of the ſolar eclipſe of January 28, N. S. and of the lunar of Auguſt 6, 1664, N. S. together with that of Auguſt 18, 1663, N. S. It was ordered, that a duplicate of the letter of April 29, 1664, which he mentions not to have received, ſhould be ſent him by the ſecretary, together with the account of what had been obſerved at London of the eclipſe of the moon on the 6th of Auguſt 1664.

The preſident acquainted the ſociety, that the experiment of weighing having been repeated upon the top of St. Paul's ſteeple, did not ſucceed this day as before, but that rather the lower weight ſomewhat preponderated; the cauſe of which difference was attributed to the windineſs of the weather. It was ordered, that the Preſident and Sir ROBERT MORAY ſhould deſire the uſe of the king's ſtatera for

[z] Mr HOOKE, in his letter of the 15th of September, cited in the preceding note, mentions this experiment: "We made on Wedneſday a very "conſiderable experiment with powder; for incloſing only ſix penny-weight of prince RUPERT's in one of our cylinders (the faſhion "whereof, I doubt not, you remember) and having very firmly ſcrewed it up, it was fired by a "ſmall touch-hole no bigger than a pin's head, "which was drilled through the ſide of it. The "effect was, that it broke the cylinder (which was "every where very ſound, and made of very tough "iron, and in the thinneſt place, where it broke, "was above half an inch, and in ſome near three "quarters thick; ſo that I can hardly think the "weight of 100 tun hung at it would have been "able to have pulled ſo much iron in ſunder point "blank) in four, if not more, pieces, and that in "ſuch places, where there was no beginning of "a crack, with a moſt hideous crack and noiſe, "like a ſmall field-piece of ordnance. The ſide, "in which the touch-hole was made, we found "intire: nor was that hole any thing widened by "the eruption of the fire. We ſhall yet again "make ſome more trials of it before we leave it, "that ſo we may bring it to ſome certainty and "theory."

[a] Letter-book, vol. i. p. 187.

this experiment, and therewith weigh both the bodies above and below: and that the committee for this and the other experiment of the celerity of falling bodies, ſhould meet again on the Monday following, about eleven in the morning, at St. Paul's.

It was ordered likewiſe, that the plate for ſounding bodies be made ready for the next meeting.

Dr. Wren being deſired to defer no longer the making of a larger teleſcopical moon for the Society, promiſed to do it againſt his next coming to London; upon which it was ordered, that the treaſurer ſhould pay for a globe of that ſize, which Dr. Wren ſhould chooſe at Mr. Moxon's.

Sir Paul Neile offered the Society his optic tube of fifty feet long; for which he received their thanks.

The powder experiment was made again with prince Rupert's powder of four penny-weight, in ſuch a caſe of ſteel as before. Being fired, it made a report without breaking the caſe, looſening only the ſcrew, which the operator affirmed to have been ſcrewed in as firmly as two ſtrong men had been able to do.

There was alſo made the experiment of ſinking a wooden ball with a ball of lead, in a ſquare wooden veſſel of about nine feet high, filled with water, having glaſs panes on the ſides. The leaden ball being hung in a ſpringing wire to a ball of wood, fell to the bottom in five ſeconds, and being fallen off by touching the bottom, the ball of wood returned to the top in nine ſeconds. And it was obſerved, that the ſizes of the leaden balls being different, the deſcent of the wooden ball ſunk by the leaden ones was always the ſwifter, the bigger the leaden ones were.

Then there were let fall in the ſame veſſel three balls of bee's-wax of three different ſizes, whereof the biggeſt were obſerved to deſcend faſteſt.

It was ordered, that at the next meeting theſe experiments be proſecuted with bodies of wood of ſeveral figures:

That the experiment of refraction be continued: And

That Mr. Hooke give a draught of the ciron or wheal-worm, as it appears in a microſcope [a].

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[a] Mr. Oldenburg, in a letter to Mr. Boyle, dated at London, Sept. 22, 1664, and printed in Mr. Boyle's Works, vol. v. p. 307, 313. gives ſome account of what paſſed at this meeting of the Society, where, he obſerves, they had the company of a Pariſian academiſt, recommended to Sir Robert Moray and himſelf. "I have "known him, adds Mr. Oldenburg, to frequent the meetings of Monſ. de Montmar: "his name is Monſ. Bley, no unlearned, tho' "here unknown, man. He was much pleaſed "with our experimental method (though we had "not any conſiderable experiments then ready) "and with our ſedate and friendly way of con-"ference;

September 28. The experiment of meaſuring the velocity of bodies deſcending in water was proſecuted in the veſſel employed at the laſt meeting; which yet wanted about a foot and half of being full of water, one of the glaſſes near the top being broken, which made ſo much water run out. There were uſed bodies of wood of the ſame kind and weight, but of different figures, cubical, a double cone, one end of which was tapering three inches, the other end two inches; a ſingle cone, tapering two inches, with a flat baſis; another of the ſame figure, tapering an inch; a pyramid of an inch, and another of the ſame figure, of two inches; and theſe three laſt alſo with flat baſes: then a cylinder, and a globe. All theſe pieces were tried with an appendant leaden weight of two ounces, and came to the bottom as follows:

	Half ſeconds.	
1. The cubical, in - - -	12½	
2. The double cone, with the end tapering three inches downwards, - -	9¼	
3. The ſame, with the end tapering two inches downwards, - - -	9½	The ſame time with the next foregoing as to ſenſe.
4. The ſingle cone, tapering two inches, with a flat baſis, - - - -	7¼ circiter.	
5. Another ſingle cone, tapering once inch, with a flat baſis, - - - -	11½ circiter.	
6. The pyramid of one inch, - -	10	
7. The pyramid of two inches, - -	8	
8. The cylinder, - - - -	12 circiter.	
9. The globe, - - - - -	9¾ circiter,	

It was ordered, that theſe experiments be proſecuted at the next meeting; and that the pendulum contrived for falling bodies be applied thereto.

There was read a letter of Dr. WILLIS to Mr. OLDENBURG, dated Sept. 21, 1664[b], giving an account of his having performed the taſk impoſed upon him concerning Mr. HORROX's aſtronomical papers, by comparing the copies with the

" ference; as alſo with the gravity and majeſticneſs of our order. We had no other experiments but that of breaking the ſteel cylinder with prince RUPERT's powder; and the deſcent of leaden, wooden, and wax balls in water. In the mean time, we ſupplied what was wanting here, by the reading of HEVELIUS's letter, and ſome reflections thereon; as alſo, with letting him ſee our contrivances for fetching up water from the bottom of the ſea, and the ſounding balls without a line; both which he was hugely taken with; as alſo with the ſtories of compreſſing a hollow leaden veſſel by the preſſure of the ſea in the Bay of Biſcay, and the æolipile by the ambient air, after the included air had been extremely rarefied. I dare ſay he will extol our inſtitution and proceedings to the ſky, whereſoever he comes; though I muſt needs ſay, we grow more remiſs and careleſs than I am willing to expatiate upon. Yet this I muſt ſay to a perſon, that I am ſure hath a concern for our proſperity, that nothing is done with the king for us; that our meetings are very thin; and that our committees fall to the ground, becauſe it is not poſſible to bring people together, though I ſolicit to the making myſelf troubleſome to others, not to ſay much of the trouble, which I create to myſelf good ſtore."

[b] Letter-book, vol i. p. 195.

originals, and digeſting all the ſeveral pieces into one body, and prefixing to it an epiſtle addreſſed to the preſident of the Society, and giving an account both of the author and the matter, in order to the printing thereof.

It was ordered, that the ſecretary return the thanks of the Society to Dr. Wallis, for his great pains and judicious digeſting of theſe papers; and that the printing thereof be left to the conſideration of the Council.

There was likewiſe read an extract of a letter from Mr. Boyle to the ſecretary, deſiring, that in the repeating of the experiment of weight made at St. Paul's, the weight to be let down may not be of the ſame kind with that, which is to hang always near the beam; but a glaſs-ball hermetically ſealed (with a little quickſilver in it, if need be, to make it equiponderant with the counterpoiſe) or ſome other body of conſiderable bulk in reference to its weight; conſidering, that if the cauſe of the decrement of weight of the body let down be, that the air near the earth being thicker, does more reſiſt, and conſequently ſupport the moſt dependent body, than the thinner air does its counterpoiſe, we may expect, that the lower air being a thicker medium, the more of bulk the body, weighed in the thinner medium, is made to have, retaining there the ſame weight, the more will it loſe of that weight when it comes to be let down into the thicker medium [c].

In the ſame letter were ſuggeſted by Mr. Boyle, towards the determining the difficulties about the magnetical virtue of the earth, eſpecially in reference to gravity, ſeveral magnetical experiments to be made at the bottom and at the top of St. Paul's ſteeple; which experiments, though eſteemed conſiderable, yet were thought not practicable at the ſaid ſteeple, by reaſon of the iron there mixed every where.

The ſecretary acquainted the Society with ſome experiments of refraction, lately made by the virtuoſi at Paris, wherein they affirmed, that they had found that the refractions follow the reaſon of ſinus's; and that the refraction of ſpirit of wine is greater than that of water.

He informed the ſociety likewiſe, from another letter from Paris, that at Rome obſervations of Jupiter had lately been made with the new glaſſes of Campani, by means of which, ſix belts had been diſcovered in that planet, four of which had appeared more obſcure, and two more clear than the reſt of his body.

The ſecretary having alſo formerly written to his correſpondents in France, to inquire into the truth of the odd experiment delivered by the jeſuit Casati, in his book, intituled, *Terra machinis mota*, p 143, and received an anſwer thereto by a perſon, who had conſulted the author of the book himſelf concerning the ſame, he communicated it to the Society; the ſubſtance of which was [d], that the ſaid Casati had not tried the experiment himſelf, but had ſeen it tried by a gentleman, named Don INNOCENZO CONTI, *viz.* that the liquor extracted out of a certain biſmutum, and well rectified, when ſealed up hermetically, and expoſed to the moon, roſe in the full, and fell in the new moon.

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[c] Mr. Oldenburg, in a letter to Mr. Boyle, dated London, Sept. 29, 1664, and printed in Mr. Boye's Works, vol. v. p. 309, obſerves, that this experiment was ordered to be made.

[d] See the paſſage of the letter itſelf in that of Mr. Oldenburg to Mr. Boyle cited above.

The experiments ordered for the next meeting were:

1. Of bodies deſcending in water.
2. Of powder of three penny-weight in the ſteel-caſe.
3. Of the refraction of ſpirit of wine.
4. Of ſounding bodies by a round plate of bell-metal, to be hung up both in the middle and at the limb.
5. Of looking upon ſome wheal-worms in a microſcope.

October 5. At the meeting of the COUNCIL were preſent,

The lord viſcount BROUNCKER, preſident.	Dr. GODDARD.
	Dr. MERRET.
Sir PETER WYCHE.	Mr. PALMER.
Mr. AERSKINE.	Mr. COLWALL.
Dr. WILKINS.	Mr. OLDENBURG.

It was reſolved, that the following form be offered to the king for his ſubſcription;

CHARLES R.

Founder, Patron, and one of the ROYAL SOCIETY OF LONDON FOR IMPROVING NATURAL KNOWLEDGE.

That the following form be offered to the duke of YORK and prince RUPERT, for their ſubſcriptions;

JAMES D.

Fellow of the ROYAL SOCIETY.

RUPERT P.

Fellow of the ROYAL SOCIETY.

And that the following form be uſed for the ſubſcription of benefactors;

I N. N. *give ſo much* ——

It was ordered, that Dr. GODDARD give directions for the preparing of a book, to be called the Charter book, wherein forthwith is to be fairly written a copy of the charter, the ſtatutes, and the regiſter of the fellows and benefactors of the SOCIETY, according as is provided by ſtatute:

That Mr. HILL, the treaſurer, ſpeedily take care, that the arrears of the Society be collected; as alſo thoſe of the ſubſcribers for Mr. HOOKE; and that in the mean time he pay Mr. Hooke both what he had received already from the ſaid ſubſcribers, and, as ſoon as conveniently he could, what ſhould yet remain due to him; the whole being 80 *l. per annum*:

That the determination for printing Mr. Horrox's manuſcript, as digeſted by Dr. Wallis, be deferred till the preſident ſhall have peruſed it, and given his judgment of the fitneſs of printing it:

That the committee, which uſed to meet on Mondays in the afternoon at Dr. Goddard's lodgings, ſhould be intermitted till farther order:

That Mr. Hooke prepare an oration upon the account of Sir John Cutler's founding of a mechanical lecture [*]; and that, between that and the next meeting, he think upon a method to proceed by in his lecture, which, upon the Council's approbation, he might give a hint of in the ſaid oration: And

That the perſons intruſted with the affair of Chelſea-college be deſired to uſe their beſt endeavours to bring that buſineſs to an iſſue.

At the meeting of the Society on the ſame day,

The experiments of the refraction of common water and ſpirit of wine were made; in the former of which, the angle of inclination being 30°, that of refraction was 41°, 35′; and in the latter, the angle of inclination remaining the ſame, that of refraction was 42°, 45′. So that the refraction of ſpirit of wine was greater by 1°, 10′, than that of the water.

The ſpirit of wine, upon trial, was found to be very well rectified. It was ſuggeſted by Dr. Goddard, that the weight of diſtilled conduit-water, and well rectified ſpirit of wine, was in proportion as 1122 to 952; and that conduit-water and the diſtilled water thereof ſcarce differed in weight.

The experiments of deſcending bodies in water not ſucceeding, by reaſon of the leaking of the veſſels, it was ordered, that this ſhould be well provided againſt for the next meeting.

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[*] Mr. Hooke, in his letter to Mr. Boyle of Octob. 6, 1664, printed in Mr. Boyle's Works, vol. v. p. 537, has the following paſſage: "I am now engaged in a very great deſign, which I fear I ſhall find a very hard, difficult, and tedious taſk; and that is, the compiling a hiſtory of trades and manufactures, the perſon I formerly told you of, namely, Sir John Cutler, having very nobly and freely, without any compulſion or excitement, not only kept his word, but been better than it, ſending me yeſterday a half year's ſalary beforehand, as an earneſt of his intention. The moſt I think I ſhall be able to do in this buſineſs this term (being engaged to read for Dr. Pope) will be only to make a ſhort ſpeech, both in praiſe of Sir John, my noble patron, and of the excellency and uſefulneſs of the deſign itſelf, and what method and courſe I ſhall take in it; and by God's aſſiſtance I ſhall endeavour, to the utmoſt of my power, to go as far in it as I am able, being reſolved wholly to apply my mind and endeavours to it."

Dr. Croune promiſed to give an account of his experiment of reviving choaked pullets at the next meeting.

The ſecretary produced an old broken earthen pot, ſaid by one Dr. Moselar to have been taken up at Tripoli at a fiſhing for coral, having on its ſeveral parts manifeſt coral-branches concreted.

Dr. Charleton and Mr. Hooke reported of the experiment, which they had made of the velocity of a bullet, ſhot out of a muſket, that, as near as they could obſerve, the bullet being diſcharged with prince Rupert's powder, went above ſix ſcore yards in half a ſecond. It was ordered to be proſecuted with more exactneſs.

Dr. Charleton mentioned, that he had lately ſhot a buzzard, which he diſſected, and found to have three teſtes lying almoſt triangularly, one leſs than the other two[f]. He was deſired to ſhoot another, when he could conveniently, and to diſſect it before the Society.

It was ordered, that the anatomical committee meet on the Monday following at two or three in the afternoon at Dr. Ent's houſe, to conſider of the particulars to be obſerved in the next anatomical adminiſtration.

There was again tried the experiment of prince Rupert's powder, to the quantity of three penny-weight, in the ſteel-caſe; the event of which was, that being fired, it came all out by the touch-hole. It was ordered to be tried again with three and a half penny-weight.

The experiments appointed for the next meeting were;

1. Of deſcending bodies in water.
2. Of the refraction of other liquors.
3. Of reviving choaked pullets.
4. Of the vibration of hard bodies ſounding with a flat round plate of bell-metal.
5. The gunpowder experiments, as above-mentioned.

October 12. There were made ſome experiments of deſcending bodies in water, the ſucceſs of which was, that four ounces of lead being hung to all the bodies, which were of the ſame kind of wood, and the ſame weight, but of different figures,

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[f] Mr. Oldenburg, in a letter to Mr. Boyle, dated from London, Octob. 6, 1664, and printed in Mr. Boyle's Works, vol. v. p. 310, 311, after mentioning this account of Dr. Charleton, adds, "If I had not been afraid of Hudibras, I had "ſeconded Dr. Charleton with the relation "of a certain apothecary in Ireland, who, as I was "aſſured by a phyſician, that has employed him "there, has alſo three teſticles, being exceſſively "given to venery. There is certainly ſomething "as well in the conformation of the parts, as in "the temper of animals, that neceſſitateth them "(if I may ſay ſo) to ſuch and ſuch operations."

	Half ſeconds.
The parallelopiped came to the bottom in - - - -	9 fere.
Pyramid of two inches high, with the ſharp end downward	7
The ſame with the flat end downward - - - - - -	9 and a little more.
Pyramid of one inch high, with the ſharp end downward	$7\frac{1}{2}$ circiter.
Cylinder - - - - - - - - - - - - - - -	9 fere.
Cone with the point downward - - - - - - -	7
The ſame with the flat end downward - - - - - -	10 and a little more.

It was ordered to proſecute theſe experiments between the days of the meeting with all the varieties, obſerving alſo the degrees of velocity; and to ſhew to the ſociety thoſe, that ſhall have been thus made, that they might not need to ſpend long time upon them.

It was ordered likewiſe, that the experiments of refraction ſhould be proſecuted with ſalt-water, wines, oil, lixivium, *&c.* and that it be examined, whether the ſeveral refractions follow the proportion of the ſinus's; which was the end propoſed in theſe experiments.

It was mentioned, that there was an inſtrument made for meaſuring the ſwiftneſs of the wind; and that Sir WILLIAM PETTY had obſerved, that a wind-mill with an ordinary blaſt of wind turned ſo often, as to go after the rate of about ſixty miles in an hour. He was deſired to take care of the making of theſe experiments, and to obſerve particularly the difference of the velocity of forced and of free wind; and to bring in an account of all.

Dr. CHARLETON related to the ſociety, that at the meeting of ſome phyſicians of the ſociety at Dr. ENT's houſe, it had been conſidered by them, what inquiries ſhould be made at the next diſſection at Greſham College; whereupon the following had been offered, *viz.* 1. Whether there be any viſible paſſage of the air into the heart? 2. Whether there be any new veſſel in the brain between the *arteriæ carotides* and the *brachia fornicis?* 3. Whether any liquor may be expreſſed out of the ſtomach immediately into the pancreas?

The plate of bell-metal being produced, and found uſeleſs for the experiments of the vibrations of hard bodies ſounding, it was ordered, that Sir ROBERT MORAY ſhould be deſired to ſhew it to Monſieur DU SON, who ſuggeſted the making of it.

Dr. SMITH acquainted the ſociety with his intention of going into France, and making ſome ſtay there, deſiring them to honour him with their commands. It was recommended to him to obſerve what is in the philoſophical meeting at Paris, and to inform himſelf of the French way of ordering vines and wine, and to take notice of all ſuch other particulars, as might ſerve for the purpoſe of the ſociety[g].

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[g] Mr. OLDENBURG in a letter to Mr. BOYLE, dated at London, October 13, 1664, and printed in Mr BOYLE's Works, vol. v. p 311. obſerves, that "part of their yeſterday's entertainment at "Greſham-College was the hearing of ſome con-"certs upon a revived inſtrument called *arehi-viole*, invented by a Frenchman twenty-one years "ago, and then notified here to Mr. HAAK. There "was

October 19. Dr. Merret brought in his catalogue of trades, which was read and approved of; and it was ordered, that the amanuenſis ſhould fairly tranſcribe it againſt the next meeting, and that then it ſhould lye expoſed, at the time of the meeting of the ſociety, for the ſeveral fellows to look it over, and to chooſe what trade they would give or procure the hiſtory of.

William Godolphin, eſq; was propoſed candidate by Dr. Charleton.

Sir Robert Moray produced a letter of Monſieur Huygens to himſelf, which was read, containing, 1. A new obſervation of Jupiter, in whoſe diſk the ſhadows of two of his ſatellites had been ſeen at Rome. 2. An account of watches with two ſprings ſo moved, that whilſt the ſmall weight is wound up by the great, it ceaſeth not to have juſt the ſame force to make the balance wheel, on which it immediately hangs, turn. 3. A ſpeculation of his own, in which, by ſearching for ſimple pendulums, iſochrone to triangles and other figures, he had met with conſiderable propoſitions, which he affirmed to conduce to the eſtabliſhing of the univerſal meaſure[h]. It was ordered, that the ſeveral experiments ſpecified in this letter ſhould be tried, and Mr. Hooke take care thereof.

The experiments of the acceleration of bodies deſcending in water were continued; and there was taken a round glaſs, made $\frac{1}{4}$ heavier by ſhot put into it than water, deſcending to the bottom in - - - - - - - - - $4''$ $44'''$

The ſame made half as heavy again in - - - - - 3 14

The ſame $\frac{3}{4}$ as heavy again in - - - - - - - 2 45

The ſame made as heavy again in - - - - - - 2 14

Theſe experiments were made ſeveral times, and are ſet down above according to their quickeſt deſcent.

It was ordered to proſecute this ſubject at the next meeting.

Dr. Croune tried his experiment of reviving a choaked pullet, but it did not ſucceed.

Sir Robert Moray gave an account of what he had obſerved in his late excurſion into the country, and promiſed to bring it in writing.

" was about that time made one of them to be " preſented to the late king. The troubles inter" vening diverted the muſic, and left the inſtru" ment imperfect, which now is brought again to " light, and by my lord Brereton's care and " expences made perfect, comprehending both an " organ and a concert of five or ſix viols in one, " giving an excellent harmony, very ſolemn and " moſt fit for religious muſic, but only that the " multitude of ſtrings maketh it ſomewhat long " and tedious to tune, the alteration of the air " putting them out of tune in a little time. Mer" ſennus gave firſt notice of it hither, ſaying, in " a letter of his, which I have ſeen, *qu' un ange,* " *à ce qu'il luy ſembloit, ne pouvoit proceder plus ſim*" *plément & gentiment*. I muſt confeſs it tranſports " me, and cannot but exceedingly pleaſe him, who " plays upon it, hearing himſelf alone perform a " whole concert of viols."

[h] Mr. Oldenburg in a letter to Mr. Boyle of the 20th of October, 1664 (Boyle's Works, vol. v. p. 312, 313.) has given an extract of Monſ. Huygens's letter, which he deſired might be communicated to Dr. Wallis and Dr. Wren.

Mr. Hooke was ordered to take care, that the inſtrument, contrived by him for grinding optic-glaſſes with more exactneſs and ſpeed[i], be forthwith made.

The ſecretary read part of Mr. Boyle's letter to him, containing ſeveral ſuggeſtions, *viz.* 1. That when there ſhall happen an eclipſe of the ſun or moon, or any very conſiderable conjunction of the planets, there might be notice diligently taken by the barometer, whether it had any ſenſible influence upon the gravitation of the atmoſphere. 2. To obſerve the like in caſe of the appearing of any great ſpots in the ſun. 3. To inquire after the ſtation of mercury in the baroſcope the 4th inſtant at London, he having found it that day at Oxford lower than ever he had obſerved it, *viz.* beneath 29 inches, which, he ſaid, he the rather mentioned, becauſe at that time, and a good while before, the winds were extraordinarily high, though there fell not much rain to alleviate the atmoſphere.

The preſident mentioned hereupon, that he had likewiſe found the mercury ſtand beneath 29 inches, but did not remember, whether it was juſt that day, on which Mr. Boyle had obſerved it ſo low.

Mr. Hooke intimated, that he had obſerved, that upon the fall of the mercury wet weather followed[k].

Sir Paul Neile renewed his former motion of obſerving the figure of the ſun at his riſing and ſetting, both at Whitehall and Greenwich. Sir Robert Moray was deſired to obſerve it at Whitehall, and to recommend the obſervation of it at Greenwich to Mr. Marre; which he promiſed to do.

October 26[l]. John Newburgh, eſq; was propoſed candidate by Dr. Wilkins: And

Samuel Woodford, eſq; by the ſame.

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[i] Mr. Hooke in a letter to Mr. Boyle dated October 21, 1664 (Boyle's Works, vol. v. p. 538.) remarks, that Monſieur Huygens's account of Jupiter's ſatellites being ſeen between the body of that planet and the eye, in his letter to Sir Robert Moray, mentioned above, “ has at length, ſays “ he, made me ſet upon my way of making ob- “ ject-glaſſes, which, you may remember, I did “ long ſince acquaint you with: for certainly, if “ theſe be made with a mandrel only, without “ any tool, as the letter affirms, I hope I have “ reaſon to expect greater events from this, which “ muſt certainly be the moſt accurate way imagi- “ nable for making ſpherical glaſſes.”

[k] Mr. Hooke in his letter to Mr. Boyle juſt cited, remarked, that upon the 4th inſtant he had found the baroſcope very low, and the wind very high, “ many of which inſtances, added he, I “ have not yet obſerved; but as ſoon as I can get “ me a little time to make me a weather-clock, “ and to ſet all my things in order for the inquir- “ ing into the cauſes of the changes of weather, “ which, I fear, will not be till after this term, I “ hope I ſhall be able to give you a better ac- “ count.”

[l] On this day the greateſt part of the members were abſent, being gone to Woolwich, together with the king and council and moſt of the court, to ſee the great ſhip St. Catharine launched; as appears from Mr. Hooke's letter to Mr. Boyle, October 29, 1664 (Boyle's Works, vol. v. p. 540) and Mr. Oldenburg's letter to that gentleman (*ibid.* p. 314.) Mr. Oldenburg himſelf going to Woolwich on that occaſion.

Dr. CROUNE mentioned, that he had made obſervations of the ſun from Tueſday noon till ſun-ſet, but found no appearance of Mercury [m].

Dr. WILKINS gave an account to the ſociety, that the lord BERKELEY, to whom the queries for the Eaſt-Indies were formerly recommended, had ſpoken with ſeveral of the Eaſt India company, who, in compliance with his lordſhip's deſire, had mentioned certain perſons now in town, who had been very much converſant in the Indies, and being very inquiſitive men were thought able to anſwer moſt of thoſe queries; promiſing withal, that ſuch of them, as they could not give a ſatisfactory anſwer to, ſhould be recommended by them to their ſeveral factors, then reſident in the Eaſt-Indies.

It was hereupon ordered, that Dr. WILKINS, Mr. COLWALL, and Dr. CROUNE ſhould be deſired to ſpeak with thoſe perſons (two of whom were Capt. PROUD and Mr. WINTER) to ſee what informations they could learn from them.

Mr. HENSHAW propounded, that it might be inſerted among the queries for the Eaſt-Indies, where and after what manner the ſalt-petre, of which there were ſuch vaſt quantities imported into Europe, is made.

Dr. CROUNE reported, that he had been lately aſſured by a perſon, who had lived long in the court of Macaſſar, that what had been affirmed of their ſtrange poiſons, is for the moſt part true; and that he had ſeen hundreds of perſons diſpatched with them: that none of the European chirurgeons were able, by any means they could uſe, to hinder the fatal conſequences of thoſe poiſons, though they immediately cut out the wound made with the poiſoned weapon; but that the perſons thus wounded would within a very ſhort ſpace fall down ſtone dead: That he could not affirm any thing concerning the poiſon's immediate reducing the dead fleſh to a jelly, having never ſeen any ſuch thing.

Mr. POVEY affirmed, that a gentleman of his acquaintance was by the bite of an Engliſh viper in the hand, after about a twelvemonth's time, killed, the ſymptoms being ſuch, that notwithſtanding all the care, that was immediately endeavoured to be uſed, they could not be removed, but a continued chilneſs ſeized on that hand and arm, which were bitten, which cauſed him to carry them continually wrapt in warm furs; and on a time waſhing his hand in cold water, it ſtruck ſuch a chilneſs on the part, as killed him.

A viper was diſſected [n], and it was obſerved, that beſides a row of ſmall ſharp teeth on either ſide of its upper and under jaw, the viper had alſo two fang teeth in the upper jaw, which, upon being provoked, it would thruſt and make ſtand out very far. Theſe through the microſcope appeared to be exceedingly ſharp and very tranſparent, nor was there any viſible ſign of perforation in them; but that tooth on the right ſide only conſiſted of two ſmall needle-teeth very ſharp, tranſparent, and lying cloſe together.

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[m] Mr. HOOKE in his letter cited in the preceding note takes notice, that Mercury had been too ſubtile for theſe that laid ſpies for him, by ſlipping by the ſun either in the night, or at leaſt by one ſide of the diſk of the ſun; "for to none of thoſe, that endeavoured to find this conjunction here at London, has there been any glimpſe of it; though upon Tueſday, as I imagined we ſhould, we had very fair and clear weather; all which day my lord BROUNCKER, Sir WILLIAM PETTY, Mr. BALLE, and myſelf were very diligent in obſervations. I did not neither omit to obſerve the ſun on Monday and Wedneſday, as oft as I had opportunity of ſeeing it appear from between the clouds."

[n] By Mr. HOOKE. See his letter to Mr. BOYLE of October 29, 1664. BOYLE's Works, vol. v. p. 540.

Dr. Merret affirmed, that he had examined the teeth of a rattle-ſnake (which animal he found exactly like a viper in all its other parts, and therefore thought, that it was not unlikely but the teeth of them might alſo reſemble each other) and obſerved, that they were very viſibly hollow, with a ſmall perforation running through the middle of them from their roots to almoſt their tops; and that he had farther proved them ſuch, by thruſting a hog's-hair through them.

November 2. At a meeting of the Council were preſent

The lord viſcount Brouncker,
preſident.
Sir Robert Moray.
Sir Paul Neile.
Sir Peter Wyche.
Mr. Aerskine.
Mr. Balle.
Dr. Wilkins.
Dr. Goddard.
Dr. Whistler.
Mr. Palmer.
Mr. Colwall.
Mr. Hoskyns.
Mr. Oldenburg.

Dr. Wilkins related, that Sir John Cutler had declared to him, that he was firm in his reſolution to ſettle upon Mr. Hooke 50 *l. per annum.* for ſuch employment, as the Royal Society ſhould put him upon.

It was ordered, that Dr. Wilkins draw up a form of thanks to be given to Sir John Cutler for his donation, declaring him withal an honorary member of the ſociety, to ſee whether it be according to his ſenſe.

It was ordered alſo, that the treaſurer prepare the accounts of the ſociety againſt the Wedneſday following; and that the Preſident, Dr. Wilkins, Mr. Colwall, and Mr. Oldenburg be a committee to examine the ſame.

It was reſolved, that the ſociety ſhall become tenants to Mr. Cole for five acres of land by Chelſea College; and that Sir Robert Moray and Sir Paul Neile treat and agree with him for the rent of that land.

It was ordered, that Sir Anthony Morgan be deſired to draw up a report for the attorney-general to ſign concerning the power, which the king hath of the grant of Chelſea College:

That the liſts of the ſociety and council be printed for the anniverſary election: And

That the operator employ himſelf diligently in collecting the arrears; and that the treaſurer direct him what perſons he ſhould collect from.

At the meeting of the Society on the ſame day,

Mr. James Hoar, Mr. Godolphin, Mr. Newburgh, and Mr. Woodford were elected:

Mr. Newburgh was likewiſe admitted; And

Sir Robert Atkins the younger was propoſed candidate by Dr. Wilkins.

There was read an extract of a letter written to the ſecretary by Mr. Boyle [o], giving an account of a monſtrous birth, lately born at Fiſherton near Saliſbury; and promiſing to communicate what obſervables might farther happen concerning it. It was ordered, that the ſecretary ſhould endeavour to procure the beſt atteſtation he could of this matter before it ſhould be regiſtered.

A letter of Monſieur Huyoens to Sir Robert Moray was read, containing, 1. An account of a new kind of thermometer [p], with a cane full of ſalt-water, having ſwimming in it a wax-ball, mixt with ſomething more ponderous, to make it ſwim about the middle, riſing and falling according to the differenr degree of heat, without being ſubject to the various preſſure of the air. 2. An intimation of his having farther penetrated into the matter of figured pendulums, and found general rules to give pendulums iſochrone as well to ſolid bodies as to planes. 3. A relation of his having ſeen with wonder at Paris a glaſs of twelve foot, of the workmanſhip of Divini, which bore the aperture of two inches Pariſian meaſure; upon which occaſion he recommends it as a matter worthy of inquiry, to know what may be the right aperture in each glaſs, of ſuch and ſuch a diſtance from the focus.

Sir Paul Neile propoſing ſeveral difficulties about this laſt particular of Monſ. Huygens's letter, the preſident was of opinion, that, notwithſtanding them, the inquiries concerning the apertures of glaſſes with proportionable charges, might be attempted.

Mr. Hooke's account of the refractions of common water, ſalt-water, and oil of turpentine, was read; wherein he found the ſinus of the angles of inclination to keep near the ſame proportion to the ſinus of the angles of refraction [q]. It was ordered, that this account be entered together with the experiments about the refraction of ſpirit of wine [r]; and that theſe experiments be proſecuted with other liquors.

There was alſo read Mr. Hooke's fuller account of the teeth of a viper ſeen thro' the microſcope tranſparent and hollow, together with other obſervations made of the internal parts of that animal; which account was ordered to be regiſtered *, as follow:

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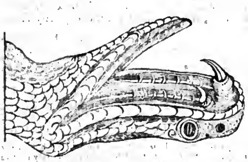
[o] Supplement to the Letter-book, vol. ii. p. 8.

[p] Which Monſieur Huyoens obſerved he had received from Mr. Sluse of Liege. See Mr. Oldenburg's letter to Mr. Boyle, dated at London, November 3, 1664. Boyle's Works, vol. v. p. 319.

[q] Mr. Oldenburg in his letter to Mr. Boyle of November 3, obſerves, that the proportion of the ſines of the angles of inclination to the ſines of the angles of refraction were near the ſame, viz. as four to three: and that as ſpirit of wine ſuffers a greater refraction than common water, ſo oil of turpentine, which is lighter than ſpirit of wine, bears not only a greater than common water, but a much greater than ſalt water.

[r] Neither of theſe papers appear in the Regiſter.

" Examining the mouth of an Engliſh ſhe-viper, I found, that in the upper part of the mouth, on either ſide, juſt under each eye, was placed a ſharp round bended tooth, not unlike in ſhape to the claws of a cat. I obſerved likewiſe, that like thoſe of a cat, they had a kind of ſheath or ſkin, which, when they were moved forward, and thereby erected, ſlipt off from the tops of them towards the roots of them, leaving that part of the fang without it, very much ſhaped like a cat's claw, but ſomewhat ſmaller and ſlenderer: but when by another motion of the mouth they were drawn backwards, and ſo depreſt, the ſkin was drawn over them, and perfectly covered them. That fang on the right ſide appeared plainly to conſiſt of two teeth, ſhaped much alike, but the fang on the left ſide was only one ſingle tooth. Theſe being let alone, till pretty dry, I could plainly perceive to be hollow, by means of ſeveral chains of bubbles, which appeared within the tranſparent hollow teeth; though whilſt the viper was alive, I could not perceive the leaſt appearance of hollowneſs, but the teeth ſeemed perfectly tranſparent conical bodies. Beſides theſe fangs, the viper had four rows of ſmaller teeth; two of which were in the upper and two in the nether chap. The bones, in which theſe ſhort ſmall teeth (with their very ſharp tranſparent points directed inward) were faſtened, were four ſmall bones or jaws, which were not joined together before, but, as in a rhinoceros, each ſide was diſtinct, and one of them could be moved without ſtirring the other. When the viper opened its mouth to bite, theſe two jaw-bones were drawn forward, and thereby made not only the fangs to be erected and bare, but they themſelves ſeemed to ſtand more out of the mouth, and the more clear to take hold of what the viper ſhould ſnap at.



" The poſition of theſe bones in the upper chap was much of the ſhape in the figure. The under chap had alſo two jaw-bones, which were not joined together before, as is uſual in other creatures, but diſtinct bones, like thoſe in the upper chap. Theſe lay nearer the tip or chin of the under chap; and about ſeven ſmall teeth on each ſide were placed in the fore-part of it: near the top of this chap, between the two rows of teeth, was placed the epiglottis, or orifice of the *aſpera arteria*. All the inward parts of this creature were as it were ſtretched into length and conveniently diſpoſed the whole length of its body. The lungs were ſpun out into two long conical lobes, conſiſting of a great number

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* Original Regiſter, vol. iii. p. 62.

“ of ſmall tranſparent bladders, covered with a very pellucid ſkin: the bladder of gall was about three inches beyond the liver, which was very large, and ſtretcht into a great length: the œſophagus, ſtomach, and the other guts lay in one continued ſtraight line from its throat (which was exceeding wide, and capable of being ſtretcht prodigiouſly) to its tail: the ſtomach ſeemed to be covered with a much thicker coat than the reſt of the entrails: it had abundance of veins and arteries, that were ſpread over it: it had a great company of eggs, which were of ſeveral ſizes, and placed all along the length of the belly. There were ſeveral other particulars very notable, which I have not yet ſufficiently examined.”

It was ordered, that Dr. Charleton bring in an account in writing of his performances in the late diſſection[t].

Mr. Hooke propoſed an experiment to be made upon a dog by diſplaying his whole thorax, to ſee how long, by blowing into his lungs, life might be preſerved, and whether any thing could be diſcovered concerning the mixture of the air with the blood in the lungs. It was ordered, that the experiment be made between that and the next meeting.

Dr. Merret produced ſome of the ſubſtance commonly called a ſtar-ſhoot. Some conceived, that it was a mucilaginous matter of a fungus, which the vulgar, ſeeing that meteor called a ſtar-ſhoot, and running to the place, where they think it fell down, and where eaſily they meet with this matter, judge it to be the ſtar-ſhoot itſelf. Others were of opinion, that it might be ſome ſpermatic matter of rams copulating with ews, and that it was not probable, that it could be a diſſolution of a fungus, ſince it was much found upon hills and downs, where no fungus's are. Others thought, that it might be frogs diſſolved, eſpecially ſince ſometimes bones were found in it. It was obſerved, that this ſubſtance was copiouſly found in Wiltſhire; and that it appeared commonly after the firſt rains in autumn. Dr. **Merret** remarked, that it would not diſſolve by boiling in water. He was deſired to procure ſome quantity of it, and to make experiments upon it, to ſee, whether he could diſcover it to be an animal or vegetable ſubſtance.

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[t] This diſſection was performed at Greſham-College on the 22d of October, 1664, as appears from a letter of Mr. Oldenburg to Mr. Boyle of that day, printed in Mr. Boyle's Works, vol. v. p. 314. And Mr. Oldenburg takes notice in another letter of the 27th of October (*ibid.* p. 315.) that Dr Charleton had affirmed to him, that in this diſſection the veins on the right and left ſide of the heart were found tranſpoſed, ſo that the *vena arterioſa* was where the *arteria venoſa* uſed to be, and *viciſſim*; as alſo that Dr. Scarburgh had aſſured him (Dr. Charleton) that in the body diſſected by him at the ſame time, the *muſculus pectoralis* was wanting. “He added, ſays Mr. Oldenburg, that when he and Dr. Ent told Dr. Scarburgh of the ſaid tranſpoſition of the veins, he urged, that the body, already buried, might be unburied again, to give him the ſight of ſo unuſual a ſtructure: which whether it be done, or not, I cannot yet inform you.” The reſult of this affair is given in the following paſſage of Mr. Oldenburg's letter of November 3 (*ubi ſupra* p. 318.): “Dr. Charleton being called to an account of his laſt diſſection, and particularly preſſed concerning the tranſpoſition, which I mentioned to you in my former from his own mouth in the preſence of others, who heard him as well as I, alledge Dr. Ent for a witneſs of his aſſertion, was obliged at our yeſterday's aſſembly at Greſham to yield, that he was miſtaken; both Dr. Ent, who was with us, and Dr. Scarburgh, having upon the unburying of the heart, and a ſtrict ſearch and examination, found no ſuch tranſpoſition: which diſcovery of the doctor's error, ſpread by his very poſitive affirmations (which made me without ſcruple deliver it alſo to you) addeth but very little to his credit. In the mean time the other anatomical obſervation concerning the defect of the pectoral muſcle is confirmed, Dr. Ent himſelf upon my particular inquiry aſſerting it with all confidence, and that the perſon, whilſt alive, had not appeared defective in his motions.”

Dr. **Wilkins**, Dr. **Croune**, and Mr. **Colwall** were put in mind to take a convenient opportunity to ſpeak with Capt. **Proud** and Mr. **Winter** concerning the Eaſt-India inquiries, how far they could be anſwered by them.

Sir **Robert Moray** undertook to ſpeak to Sir **Ellis Leighton** in the name of the ſociety, and to deſire him in their behalf, to procure for them a ſpecimen of all the natural productions brought out of Guinea.

Dr. **Croune** offered to ſend the inquiries of the ſociety for the Eaſt-Indies, and to procure a good anſwer to them. The amanuenſis was ordered to make a copy of thoſe inquiries, and to inſert the query concerning the manner of making ſaltpetre in thoſe parts.

He was deſired to bring in writing a punctual account of the operations of the ſtrange poiſons uſed by the king of Macaſſar in the iſland of Celebes; which he promiſed to do.

Dr. **Ent** was deſired to diſſect ſome vipers and frogs in a convenient ſeaſon; and Dr. **Wilkins** and Mr. **Hooke** to be preſent at the operation.

Dr. **Ent** was put in mind of the account, which he formerly promiſed to give in, concerning oiſters.

Sir **Robert Moray** produced a paper of the earl of **Craford-Lindsey**, the reading of which was deferred till the next meeting.

Mr. **Hooke** was ordered to endeavour to have his new inſtrument for grinding optic-glaſſes ready againſt the next meeting.

Capt. **Taylor** brought in ſome curious ſtones, amongſt which was a very fine ſerpentine-ſtone, and ſome *alumen plumoſum*.

November 9. At a meeting of the **Council** were preſent

The lord viſcount **Brouncker**, preſident.
Mr. **Howard**.
Sir **Paul Neile**.
Sir **Robert Moray**.
Sir **Anthony Morgan**.
Mr. **Aerskine**.
Mr. **Balle**.
Mr. **Palmer**.
Dr. **Wilkins**.
Dr. **Goddard**.
Mr. **Hill**.
Mr. **Colwall**.
Mr. **Hoskyns**.
Mr. **Oldenburg**.

It

It was ordered, that the treaſurer bring in his accounts at the next meeting:

That the liſts of the ſociety and the council be printed for the anniverſary election day; and that Mr. HOARE, Mr. GODOLPHIN, Mr. WOODFORD, and Mr. BEAL, though not yet admitted, be inſerted: And

That the charter-book be made ready with all poſſible ſpeed to be preſented to the king.

Sir ANTHONY MORGAN promiſed to draw up a report for the attorney-general to ſign concerning his majeſty's power to give a grant of Chelſea College [*].

Sir PAUL NEILE reported, that Mr. COLE had declared to him, that he would by no means take any more from the ſociety for the five acres of land lying about Chelſea College, than he could get from others, without any colluſion; and that he would cauſe a leaſe to be drawn up, for the ſociety to become his tenants.

At the meeting of the SOCIETY on the ſame day,

Sir ROBERT ATKYNS the younger was elected.

Sir JOHN CUTLER having founded a lecture, and ſettled an annual ſtipend of fifty pounds upon Mr. HOOKE, as profeſſor, during his life, intruſting the ſociety with direction and care thereof, was elected honorary member of the ſociety. And Sir WILLIAM PETTY, Dr. WILKINS, Dr. WHISTLER, and Mr. GRAUNT were appointed to attend him in the name of the ſociety, with the following order:

"Upon report made to this ſociety by Dr. WHISTLER, that Sir JOHN CUTLER knt. and bart. had declared his reſolution to beſtow upon Mr. ROBERT HOOKE, during his life, an annual ſtipend of fifty pounds, to be paid half-yearly, having already advanced the ſum of twenty-five pounds for the firſt half year ending at Lady-day next; in conſideration of which yearly ſtipend, the ſaid Sir JOHN CUTLER is willing to refer it to the preſident, council, and fellows of the Royal Society of London for improving natural knowledge, to direct and appoint the ſaid Mr. HOOKE how many lectures he ſhall read, and when, and upon what ſubjects; or what kind of inquiries, by way of experiment, he ſhall be engaged to proſecute; this ſociety doth hereupon return their hearty thanks to Sir JOHN CUTLER for his particular favour to a worthy member, and for that reſpect and confidence he hath hereby expreſſed towards the whole body: And they do likewiſe unanimouſly agree to admit the ſaid Sir JOHN CUTLER an honorary member of this ſociety, to have the liberty of being preſent at their meetings, when and as often as he pleaſeth, without being obliged to any payments or other taſks. And Sir WILLIAM PETTY, Dr. WILKINS, Dr. WHISTLER, and Mr. GRAUNT

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[*] Mr. OLDENBURG in a letter to Mr. BOYLE, dated at London November 10, 1664 (BOYLE's Works, vol. v. p. 322.) has this paſſage: "Our council is now preſſing to have an end of Chelſea College; which, we doubt not, but it will prove good; in which caſe Mr. HOWARD will be the ſociety's gardiner, without admitting of any competitor, and Dr. WILKINS the weeder."

"are hereby appointed to attend Sir John Cutler in the name of the ſociety, "and to repreſent to him what a ſenſe they have of his favour, which they have "the more reaſon to value, as being the firſt donation they have been intruſted "with of this kind, and which they hope will prove a leading example to others."

There were read two letters of Mr. Boyle to the ſecretary, one of which gave an account of the death and diſſection of the double child born at Fiſherton near Saliſbury [*], that they died the third day after they were born; one of them about a quarter of an hour before the other; and that, being opened, they were found to have their parts double, and duly formed and placed, except that the guts being continued from the pylorus of both the ſtomachs about ſix feet, upon inflation afterwards met in a common channel; and that from thence to the blind gut the length was above one foot, and thence two feet to the fundament, which they had but ſingle; as alſo the matrix.

The other letter gave notice of an anatomical obſervation made in a body diſſected at Oxford, having but one kidney, and never having had more, ſeeing that the emulgent veſſels, which uſed to go to the right and to the left-hand to the reſpective kidneys placed in thoſe oppoſite ſides, terminated in this one kidney, which was near as big as two ordinary ones, and which was furniſhed with two ureters inſerted into the bladder at the uſual places [x]. This perſon died of a dropſy at the age of about thirty-five years, having been notorious for a ſtout drinker; and if he had not been ſo, Mr. Boyle was of opinion, that his ſingle kidney might perhaps have ſerved his turn for many years longer.

It was ordered, that Mr. Boyle ſhould be deſired to leave with the ſociety the Latin original of Mr. William Hand, concerning the diſſection of the monſtrous birth, of which a copy ſhould be made for him.

An account was brought in by Mr. Hooke of an experiment of refraction made with pure and clear ſalad-oil, which was found to have a much greater refraction than any liquor, which he had yet tried; the angle of refraction, that anſwered to an angle of inclination of 30 degrees, being found no leſs than 46 deg. 30′; and the angle of refraction, that anſwered to an angle of inclination of 20 deg. being 29 deg. 47′.

It was ordered, that this experiment be made before the ſociety at the next meeting, and that the inſtrument be fixed; as alſo, that other liquors, as ſeveral wines, aqua fortis, aqua regia, milk, *&c.* be tried, and that in ſeveral temperaments of heat and cold.

Mr. Hooke acquainted the ſociety in writing with the ſucceſs of the experiment made upon a dog cut open alive, and kept ſo for above a whole hour, by means of a pair of bellows and a pipe thruſt into the wind-pipe of the dog; whereby the lungs being blown, the heart continued beating for a long while after the thorax and belly had been diſplayed, and a great part of the diaphragm cut away.

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[*] See Mr. Boyle's Works, vol. v. p. 315—318.

[x] Mr. Oldenburg in his letter to Mr. Boyle of November 10, 1664 (Boyle's Works, vol. v. p. 321.) remarks, that Dr. Ent mentioned upon this occaſion, that he had obſerved, that when one kidney was ſtopt, there commonly followed an iſchuria.

It was ordered, that this account be entered[y], and that the phyſicians of the ſociety conſider againſt the next meeting, whether and how the experiment might be farther improved.

Mr. HOOKE's account was as follows:

"In proſecution of ſome inquiries into the nature of reſpiration in ſeveral animals, a dog was diſſected, and by means of a pair of bellows, and a certain pipe thruſt into the wind-pipe of the dog, the heart continued beating for a very long while after all the thorax and belly had been opened; nay, after the diaphragm had been in great part cut away, and the pericardium removed from the heart. And from ſeveral trials made, it ſeemed very probable, that this motion might have been continued as long, almoſt, as there was any blood left within the veſſels of the dog: for the motion of the heart ſeemed very little changed, after above an hour's time, from the firſt diſplaying the thorax; though we found, that upon removing the bellows, the lungs would preſently grow flaccid, and the heart begin to have convulſive motions: but upon renewing the motion of the bellows, the heart recovered its former motion, and the convulſions ceaſed. Though I made a ligature upon all the great veſſels, that went into the lower part of its body, I could not find any alteration in the pulſe of the heart; the circulation, it ſeems, being performed ſome other way. I could not perceive any thing diſtinctly, whether the air did unite and mix with the blood; nor did I in the leaſt perceive the heart to ſwell upon the extenſion of the lungs: nor did the lungs ſeem to ſwell upon the contraction of the heart."

It being ſaid, that air was felt to paſs through the lungs, Dr. GODDARD conceived, that it might do ſo upon a ſtretch, and by more than ordinary force: but if it ſhould do ſo in an animal unopened, and paſs in a conſiderable quantity into his breaſt, and lodge there between it and the lungs, it might be a prejudice and hindrance to the motion of the lungs.

The ſtar-ſhoot, vulgarly ſo called, being again ſpoken of, it was ſuggeſted by Dr. WILKINS, whether it might not be the matter, that being ſpewed out of the earth, would produce a fungus, if their time of growing was not ſpent. Dr. MERRET ſaid, that if it were a fungous ſuſtance, it would turn to water, which it did not do, nor diſſolve in oil. Others were of opinion, that the rankneſs of the ſmell ſeemed to ſhow it to be an animal ſubſtance.

Mr. HILL mentioned a book lately publiſhed in Italy, as Dr. POPE had written to him, containing 800 ſorts of fungus's.

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[y] Original Regiſter, vol. iii. p. 64.

Dr. MERRET remarked, that there were above an hundred ſorts of them in England.

Mr. HENSHAW related an obſervation, which he had made in France, of the frog-ſpawn, and promiſed to bring it in writing.

Sir ROBERT MORAY mentioned a certain ſubſtance ſeen by him, both floating upon the ſea near the ſhore, and left alſo on the ſhore, being like a jelly or ſtarch, ſeeming to contract and dilate itſelf, and which being diſſolved in water, yielded a very offenſive ſmell. His account was confirmed by Mr. HENSHAW.

Dr. WILKINS acquainting the ſociety, that ſome of the Eaſt-India company were ready to attend them, to give ſatisfaction to ſome of their inquiries, it was ordered, that the preſident, and as many of the committee for correſpondence, as conveniently could, ſhould give them a meeting on the Friday ſe'nnight following in the afternoon at ſome place, which ſhould be agreed upon between this and that time.

Mr. EVELYN preſented the ſociety with his *Parallel of the antient architecture with the modern, in a collection of ten principal authors, who have written upon the five orders: from the French of* ROLAND FREART, *Sieur de Cambray. To which is added an account of architects and architecture in an hiſtorical and etymological explanation of certain terms particularly affected by architects:* printed at London 1664, in folio.

Mr. HENSHAW preſented to the ſociety his brother's book, entituled, *A regiſter of the air.*

Sir ROBERT MORAY produced a written account of the earl of CRAFORD-LINDSEY concerning ſetting and planting of trees ſeveral ways.

Mr. PALMER produced a very heavy mineral-ſtone, conceived to be tin-ore, which was referred to Mr. HOOKE to weigh it in water.

The experiments appointed for the next meeting were,

1. Of refractions.

2. Of making ſimple pendulums iſochrone to triangles and other figures and bodies differently ſuſpended.

November 16. At the meeting of the COUNCIL were preſent,

The lord viſcount BROUNCKER, preſident.
Mr. HOWARD.
Mr. AERSKINE.
Sir PAUL NEILE.
Sir ROBERT MORAY.
Sir PETER WYCHE.
Mr. BALLE.
Dr. WILKINS.
Dr. GODDARD.
Mr. HILL.
Mr. COLWALL.
Mr. HOSKYNS.
Mr. OLDENBURG.

It was ordered, that the liſts and ſummons be printed againſt the Monday following, and the ſummons directed by the amanuenſis, and then by the operator brought to the preſident to ſign them :

That Dr. WILKINS draw up a diploma in Engliſh for Sir JOHN CUTLER as honorary member of the ſociety : And

That the amanuenſis extract out of the charter the title of the ſociety, and what concerns their power to purchaſe, and to plead and be impleaded, for the uſe of Mr. COLE.

It was reſolved, that there ſhall be a curator by office ; and that Mr. HOOKE be propoſed to the ſociety as ſuch.

At the meeting of the SOCIETY on the ſame day,

Sir ROBERT ATKYNS the younger and Mr. WOODFORD were admitted.

THOMAS THYNNE, eſq; was propoſed candidate by Sir PAUL NEILE ; and NICHOLAS BAGNAL, eſq; by Mr. BALLE.

The preſident, according to the ſtatute, gave notice of the anniverſary election-day approaching, and how much it imported the good of the ſociety to chooſe ſuch perſons into the council, as were moſt likely to attend the meetings and buſineſs of the council ; and thereupon deſired the ſociety to conſider of this matter, and of the perſons fit for that purpoſe.

The ſecretary produced a ſmall French book, written by father CHARLES BURGONIS againſt Monſieur PASCAL's Treatiſe of the equilibrium of liquors and the weight of the air. It was printed at Paris in 1664, and intituled, *La verité du vuîde contre la vuîde de la verité, ou l' on decouvre la veritable cauſe des effets, qui juſques icy ont eſté attribuez à l' horreur de vuîde, contre l' erreur, qui les attribue a la peſunteur de la maſſe de l' air : par le P.* CHARLES BOURGONIS, *religieux Auguſtin.* The preſident took it home for his peruſal, in order to give an account of it to the ſociety.

It being ſuggeſted, that thoſe philoſophical books, which were preſented to the ſociety, might be peruſed by ſome or other of the fellows thereof, and Dr. HENSHAW having lately cauſed his *Regiſter for the air* to be preſented, Dr. GODDARD was deſired to peruſe it, and to make a report thereof to the ſociety.

Mr. HOOKE undertook to diſſect a viper, and to bring in his obſervations upon it at the next meeting.

Dr. MILLINGTON had leave to be preſent at this meeting, introduced by Dr. WILKINS ; Mr. TYRREL by Mr. AERSKINE, and Dr. NEEDHAM by Sir ROBERT MORAY.

Mention being made again of the experiment upon a dog cut open alive, and kept ſo above an hour by means of bellows thruſt into his pipe, &c. Dr. NEEDHAM related, that they had lately diſſected a dog at Oxford, and by blowing into the receptaculum chyle, renewed the beating of the heart without the motion of the lungs.

Mr. HOOKE reported, that the mineral ſtone, ſuppoſed to be a tin-ſtone, produced by Mr. PALMER at the preceding meeting, being weighed in water, was found to be 6½ times as heavy as water.

The preſident mentioned, that upon his own obſervations, by the mercurial barometer, the temper of the air, as to heat and cold, might be known, as well as to its preſſure.

It was ordered, that obſervations of this kind ſhould be made with canes of greater difference, and with more nice diviſions; thoſe of the preſident not being intended for ſuch, nor taken notice of till lately.

Monſieur HUYGENS's experiment of ſimple pendulums being iſochrone to triangles and other figures and bodies differently ſuſpended were begun to be made, verifying what he had written, that a triangle rectangle and iſoſceles being ſuſpended by the top, or by the middle of its baſe, and agitated on the ſide, is iſochrone to the ſimple pendulum of its perpendicular altitude.

Mr. HOWARD produced a little piece of the fat of a man, who had, by his relation, been buried thirty years, and whoſe body was all conſumed except a lump of fat, from which the piece, that was ſhewn, was taken; which being put upon the fire, burnt and ſmelt like fat.

There were read two or three experiments of refraction, *viz.* with cold, hot, and ſalt water, of which the hot and cold water were refracted alike, their angle of inclination being 30 deg. that of refraction 42 deg. *ferè*. But the ſalt-water at the ſame angle of inclination had an angle of refraction of 44 deg. By which it ſeemed, that ſalt increaſes the refraction.

It was ordered, that water ſhould be farther tried with ſeveral degrees of ſaltneſs, to ſee, whether by the degree of refraction the degree or quantity of ſalt might be diſcovered; as alſo with ſeveral ſorts of ſalt fixed and volatile, eſpecially to obſerve, whether volatile ſalts diſſolved in water would increaſe the refraction.

It was hinted, that by the experiments of refraction hitherto made it ſeemed, that the ſimpleſt liquors have the leaſt refraction; and, on the contrary, that liquors conſiſting of different parts ſuffer greater refractions.

Dr. GODDARD propoſed, that trial might be made of turbid and coloured waters. Others propoſed oil of vitriol, ſpirit of nitre, aqua regia, and aqua fortis; and to let the ray paſs out of air into water, and out of that into other kinds of liquors, and out of them into glaſſes, *&c.* to ſee how the refractions thus ordered differ.

Sir Robert Moray inquired, whether a contrivance might not be made to obſerve the refractions of ſteams and ſmokes, *&c.*

He moved, that the refractions of one and the ſame liquor might be tried at ſeveral inclinations.

Mr. Hooke propoſed to find the difference of the refractions of air, and the vacuity of air in a glaſs.

He was ordered to bring in a liſt of experiments of refractions at the next meeting.

The experiments appointed for the next meeting were the refractions of oil of turpentine and other liquors.

And Mr. Hooke was ordered to give an account of his anatomical experiment.

November 23. At the meeting of the Council were preſent

The lord viſcount Brouncker, preſident.
Sir Paul Neile.
Sir Robert Moray.
Mr. Howard.
Sir Anthony Morgan.
Sir Peter Wyche.
Dr. Wilkins.
Dr. Goddard.
Mr. Palmer.
Mr. Balle.
Mr. Colwall.
Mr. Hill.
Mr. Hoskyns.
Mr. Oldenburg.

It was ordered, that the preſident be deſired to declare to the ſociety this afternoon, that the council thought good to have a curator by office, and to allow him *pro tempore* 30 *l. per annum*:

That Mr. Hooke ſtanding for a curator's place, be this afternoon propoſed candidate by Dr. Wilkins; as the doctor nominated him to the council:

That the preſident be deſired to ſign a licence for the printing of Mr. Hooke's microſcopical book[a]: And

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[a] Mr. Hooke, in a letter to Mr. Boyle, dated at London November 24, 1664 (Boyle's Works, vol. v. p. 541, 542.) mentions, that his microſcopical obſervations had been printed off above a month; "and the ſtay, *adds he*, that has retarded "the publiſhing of them, has been the examination of them by ſeveral members of the ſociety; "and the preface, which will be large, and has "been ſtayed very long in the hands of ſome, who "were to read it. I am very much troubled there "is ſo great an expectation raiſed of that pamphlet, being very conſcious, that there is nothing "in it, that can anſwer that expectation; but ſuch "as it is, I hope I ſhall prevail with the printer to "diſpatch it ſome time this or the next week."

That Mr. Hooke give notice in the dedication of that work to the ſociety, that though they have licenſed it, yet they own no theory, nor will be thought to do ſo: and that the ſeveral hypotheſes and theories laid down by him therein, are not delivered as certainties, but as conjectures; and that he intends not at all to obtrude or expoſe them to the world as the opinion of the ſociety [a].

At the meeting of the Society on the ſame day,

Mr. Godolphin was admitted:

Mr. Bagnal elected and admitted:

Mr. Thynne elected: And

John Hervey, eſq; treaſurer to the queen, propoſed candidate by the preſident.

The preſident, according to ſtatute, nominated five of the fellows of the ſociety, who were not members of the council, to be a committee for auditing and examining this year's accounts of the treaſurer; which fellows were Sir William Petty, Sir John Lowther, Mr. Neile, Dr. Balle, and Mr. Graunt; and they were likewiſe, according to ſtatute, put to the ballot, and all five elected of the ſaid committee; which was ordered to meet for the purpoſe above-mentioned at Sir John Lowther's lodgings on the Monday following in the afternoon.

The preſident produced two letters, containing an account of ſome natural things obſerved in Iceland, by way of anſwers to ſome inquiries ſent thither from the ſociety. One of theſe letters, written July 26, 1664, by Paul Biornonis to Mr. Flint at Runton, gave ſome account of the effects of cold, the icy mountains, hot ſprings, and huſbandry of that country. The other, written by the ſaid Flint November 14, 1664, gave a fuller information of ſeveral particulars relating to the ſaid iſland, as he had received it from the mariners, who went thither, *viz.* concerning the mountains of ice, and their generation; the appearance of the celeſtial bodies; the tides, winds, variation of the magnetic needle, the kinds of vegetables growing there, the conſtitution and humour of the natives.

The preſident was deſired to ſollicit an anſwer to the reſt of the queries; and it was ordered, that an extract of theſe letters ſhould be made, and inſerted in the Letter-book [b], as follows:

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[a] Mr. Hooke accordingly, in his dedication to the Royal Society inſerted the following paſſage: "The rules you have preſcribed yourſelves in your philoſophical progreſs, do ſeem the beſt, that have ever yet been practiſed; and particularly that of avoiding dogmatizing, and the eſpouſal of any hypotheſis not ſufficiently grounded and confirmed by experiments. This way ſeems the moſt excellent, and may preſerve both philoſophy and natural hiſtory from its former corruptious. In ſaying which I may ſeem to condemn my own courſe in this treatiſe, in which there may perhaps be ſome expreſſions, which may ſeem more poſitive than your preſcriptions will permit. And though I deſire to have them underſtood only as conjectures and queries (which your method does not altogether diſallow) yet if even in thoſe I have exceeded, it is fit, that I ſhould declare, that it was not done by your directions."

[b] Letter-book, vol. i. p. 206—210.

“ My Lord,

“ I have at laſt tranſmitted to your lordſhip an account of Iceland, which had
“ come ſooner to your hands, but that I have hitherto wanted the convenience
“ of a ſafe meſſenger. Your lordſhip knows too well how imperfect it is; which
“ happens, partly becauſe my correſpondent doth here profeſs himſelf in this his
“ αὐτογραφον but a ſtranger, and partly becauſe my letter came not to his hand till
“ our fleet was coming away; but he told my meſſenger, that by the next return
“ he would ſend me ſome ſeeds of plants, and birds, and inſects alive (if poſſible)
“ ſuch as our country doth not afford; and that he would make farther inquiry
“ into all the queries by the help of ſome others: and what ſatisfaction the coun-
“ try can give of itſelf, I dare promiſe your lordſhip by the next poſt.

“ In the mean time, beſides this account, which your lordſhip may receive by
“ this letter, map, and book (which I ſuppoſe no rarity to your knowledge) I
“ have laboured to give your lordſhip ſome farther ſatisfaction from the mariners,
“ that go conſtantly thither.

“ The iſlands of ice are generally ſuppoſed to have their firſt matter from the
“ mountains in Groenland, and being frozen before they come into the ſea, they
“ then receive the impulſes of the ſalt-water, which being broken by its own vio-
“ lence, is ſoon frozen to the firſt freſh cruſt, which by northern winds are driven
“ down to iſlands, and by reiterated combats with the waves, augment their
“ magnitude to thirty-five and ſometimes forty fathom beneath the water. I am
“ certainly informed, by a very ſkilful and honeſt maſter, that he obſerved one of
“ theſe iſlands to ground, and ſoon after, upon the tide, it floated away; and he
“ went directly to the place and ſounded, and found it thirty-five fathom; and
“ that another, by the ſame experiment, had found it in another place forty
“ fathom. Theſe iſlands do yet receive a farther increaſe from the ſnow, which
“ being melted by rains, and then frozen again, makes the upper part very
“ hard and compact, and in hight above the water eight, ten, and ſometimes
“ twelve foot.

“ Witches (or perſons ſo ſuppoſed) are in that country: a particular relation
“ of that query I expect by another hand.

“ The bodies of the ſun and moon ſeem much larger there than here: the juſt
“ diameters I have not yet obtained.

“ The moon hath appeared to our mariners, who always come away in the
“ beginning of Auguſt, within fourteen hours after the change.

“ The tides riſe and fall unequally in the ſeveral ports, as here in England; but
“ very ſeldom riſe or fall above three foot, for the moſt part two, or two and a
“ half: the ſpring tides and common tides happen much about the ſame time
“ with us.

“The winds are unconſtant there as here, ſave only from a place, which they call Fairforeland to Kettle-bay (which is about eighteen leagues) the wind blows conſtantly either S. W. or N. E. which is juſt the ſituation of that country.

“I ſent a weather-glaſs, which your lordſhip may perceive by the letter, wherein I find his miſtake, as if it were expected again: another was broken in the carriage; the third I have, which I think I ſhall have an opportunity to ſend to Greenland. I received this bladder, which was taken from one of the largeſt ſheep, wherein I obſerve the air to be expanded ſince I received it.

“Meats boiled or roaſted retain that accidental heat there, more than twice as long as here.

“The magnetical needle varies unequally, declining faſter (but ſtill unequally) as they come near the land.

“There are few birds, beaſts, fiſhes, or inſects, which we have not here: what are rare I expect by the next. Few or no birds will live there in winter, except the raven.

“There is no wood, which grows there except birch, which ſeldom grows big enough to be ſerviceable for building: but they are in ſome meaſure ſupplied with good fir-trees, blown upon their coaſts; nor can I yet receive any good ſatisfaction from whence they come; they ſuppoſe from Norway, but the winds, which bring them thither, do point more northernly.

“The natives are ſtrong, healthy, and very kind, though coarſe and dirty; their apparel very rough and homely, being waddmall; their houſes are commonly grots or vaults made in the ſide of a hill, and covered with turf, which is alſo their firing. Whey, when it is ſour, is their beer, and ſtock-fiſh is their bread; beef and mutton (if it die alone) is their food, for then they ſay it is of CHRIST's own killing, and ought to be reckoned in the number of delicacies.

“One of the natives came to Yarmouth with this fleet, and came to my houſe to give me a viſit; but not having been at any univerſity, nor of profound natural parts, I could not learn ſo much from him as from our own ſeamen.

“My Lord, what is defective in this narrative, I ſhall endeavour to ſupply in my next, having heard of another in that country, who is very curious in natural diſquiſitions, and ſolid in his reſolutions. If your lordſhip pleaſe to add any more queries to the former, and impart them to Sir ROBERT PASTON, they will ſafely come to the hands of,

“MY LORD,
“Your lordſhip's moſt humble,
“and moſt faithful ſervant,
“RO. FLINT.”

" *An extract of a letter written by* Paulus Biornonis, *out of Iceland, to which the " precedent letter referreth.*

" ——— Nullus pinguis liquor gelu apud nos corripitur, neque ſpiritus vini. " Gelu, ubi maxime, tres pedes penetrat terram, ſæpiſſime duos. Inſulas glaciales nullas novi; ſolum fruſtra glaciei Groenlandicæ, quæ borea flante huc impelluntur, nata in aquis Groenlandicis, atque exinde ejecta in mare, ſubinde accreſcentia cumulis nivium; eminent verò hæc fruſtra ex mari, ubi maxime, duodecem pedes. Fontes calidi hic multi, adeo ferventes, ut ad dimidium horæ caro bovina, ollâ cum frigida aqua impoſita, ſatis decoquatur, ne dum ſufficiat ad deplumandam avem. De Hecla aliiſque ejuſmodi montibus, ut de Ætna in Sicilia, idem judicium. Agricultura apud nos nulla, vaccæ fœno hyeme vivunt; equi, oves, gramine, quod à nive liberum eſt ſæpiſſime.

" Verum nunc tabellarius urget, ut ipſe vides: promitto tibi igitur, quantum in me eſt, quàm primum licet, reſponſionem, qualis ſperari à me poterit."

The lord Brereton mentioned the experiment, which he had made in the country, of cauſing beer to be brewed of barley without malting, by turning it into bread, and that it ſucceeded very well; only that ſome caution muſt be uſed in the practice thereof, *viz.* that the bread muſt not be maſhed too ſmall, the water not be heated too hot, nor the pieces of bread lie too cloſe upon one another, *&c.* Whereof his lordſhip promiſed to bring in a fuller account hereafter.

He mentioned likewiſe, that potatoes alſo would make good beer; of which the Society ſhould have an account in due time.

There was made an experiment of oil of turpentine and common oil; and it was found, that the former, at an angle of inclination of 30°, had an angle of refraction of 40° 59′, and the latter, at the ſame angle of inclination, an angle of refraction of 46° 29′.

Sir Robert Moray propoſed, out of a letter of Monſ. Huygens, that the whole tube might be filled with the liquor, the refraction of which was to be examined, and the glaſs put at the lower end, and ſet exactly at right angles to the tube.

He likewiſe moved, that theſe kinds of experiments might be made with ſeveral quantities of the liquors, and with veſſels of ſeveral ſizes containing them.

He propoſed alſo a way to know certainly the refractions of celeſtial bodies, *viz.* that ſince watches are reduced to that exactneſs, that they do not fail a minute in three or four months, to ſhew the ſun's mean motion, that for the perfect knowledge of the refractions of the ſun, moon, and ſtars, there needs no more for the ſun than a ſun-dial, by which one may know the minutes and ſeconds of the hour; which being compared with thoſe of ſuch an exact watch, and the difference reduced to degrees and minutes, ſhew the refraction preciſely.

Mr. Hooke mentioned an inſtrument for meaſuring the refraction, which celeſtial bodies ſuffer in the air. He was ordered to bring in a ſcheme of it at the next meeting; as alſo, to take care, that his quadrant be made ready for diſcovering a ſecond minute by a ſun-dial or the ſtars.

The preſident gave the Society an account of a new way for making an univerſal meaſure, propoſed in a letter to Sir Robert Moray by Monſ. Huygens[e], as being his own invention; which is as follows: The diſtance of the center of the bullet from the point of ſuſpenſion, as the firſt term (the ſemediameter of the bullet being the ſecond term) added to two fifths of the third proportional term, equals the diſtance of the center of vibration from the point of ſuſpenſion. To apply which to an univerſal meaſure, take a bullet of any metal, and hang it by a very fine ſtring, which make of that length, that it may vibrate juſt ſeconds, or half-ſeconds; and when you have the exact meaſure of time, according to this rule, you have the certain length of the center of vibration, which is the univerſal meaſure. The length Monſ. Huygens finds to be 9½ Rhynland inches, the vibrations being half-ſeconds.

It was ordered, that againſt the next meeting there be prepared two pendulums vibrating half-ſeconds, with balls having diameters one conſiderably bigger than the other; and that they be adjuſted before, to ſee whether the proportion held.

It was ordered likewiſe, that the ſecretary look over the notes of the laſt winter's meetings, to ſee what experiments concerning cold were then ſuggeſted and left untried: And

That the experiments for refractions be continued, according to the liſt brought in by Mr. Hooke[d].

Mr.

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[e] This letter is dated at the Hague, Nov. 21, 1664. N. S. and is entered in the Letter book of the Society, vol. i. p. 225—228. Mr. Oldenburg, in a letter to Mr. Boyle, of Decemb. 3, 1664. (Boyle's Works, vol. v. p. 328.) remarks, that when this letter of Monſ. Huygens was read to the Society, order was given, that it ſhould be punctually regiſtered at the ſame time, to the end, that Monſ. Huygens might have his due, and that his inventions be recorded for his honour to poſterity, as well as the inventions of the Engliſh virtuoſi. "This juſtice and generoſity of our So-"ciety, adds Mr. Oldenburg, is exceedingly "commendable, and doth rejoice me, as often as "I think of it, chiefly upon this account, that I "thence perſuade myſelf, that all ingenious men "will be thereby encouraged to impart their "knowledge and diſcoveries, as far as they may, "not doubting of the obſervance of the old law "of *ſuum cuique tribuere.*"

[d] Theſe experiments were deſigned, as appears from a letter of Mr. Oldenburg to Mr. Boyle, dated at London, Nov. 24. 1664. (Boyle's Works, vol. v. p. 326) to examine the refraction anſwering to ſeveral degrees of inclination: To examine the comparative refraction of ſeveral liquors to common water: as, of all ſorts of oils, made by expreſſion or diſtillation; and to do this with ſeveral degrees of inclination: To examine how much the refractions of liquors are altered by mixing of ſeveral liquors together, that do, as it were, penetrate each other; as having examined the refraction of oil of vitriol and common water each of them apart, to mix them together, and find what is the compounded refraction, by mixing alſo of acid and ſulphureous liquors, *&c.* To examine farther the refraction of liquors, wherein hath been diſſolved a determinate quantity of ſome kind of ſalt, as of ſea ſalt, common ſalt, ſalt-petre, alum, vitriol, alcali, tartar, *&c.* To examine the compa-

ratiue

Mr. Hooke was, by Dr. Wilkins, propoſed curator by office to the Society; and the preſident acquainted them, that the Council had found it neceſſary to have a curator; and that they would allow him, *pro tempore*, thirty pounds a year, the preſent revenue of the Society not being well able to bear a greater allowance; and that Mr. Hooke was contented with that ſum for the preſent, Sir John Cutler having ſettled upon him, during life, fifty pounds a year, upon the account of reading lectures of experimental philoſophy: which addition had made him willing to accept, *pro tempore*, of thirty pounds a year from the Society for performing the office of a curator.

The Society voted, that he ſhould be diſpenſed with, as to the viſitation of the Council.

Mr. Hooke mentioned a way of finding a ſecond minute by a teleſcope, and was ordered to put this into practice.

He was ordered to make another diſſection of a viper, and to do it in the preſence of Dr. Ent and ſome other phyſicians of the Society, for the ſame purpoſe, for which he had lately done it; whereof he brought in an account in writing, which was read, and ordered to be regiſtered[e], as follows:

“ In proſecution of ſome inquiries about reſpiration, I diſſected a viper, and examining its lungs, I found the particulars very notable:

1. “ That having opened all the thorax and belly of the viper, from head to tail, I found, that it was able to extend a little, and as it were fill its lungs, notwithſtanding a great part of them were open to the external air; the reaſon of which ſeems to be, that the part drying very faſt, the film of the lung ſtuck faſt to the *pleura*, or concave ſide of the ribs, and thereby, upon the opening of thoſe ribs, the lungs were opened alſo: but this was accidental and not natural, the lungs at firſt ſeeming not to ſtick or adhere to them at all.

2. “ I found, that by thruſting a ſmall pipe into the *aſpera arteria*, and blowing in at it, I was able to diſtend the lungs to a very great bigneſs; and by making a ligature in the throat, about the *aſpera arteria*, the air blown into them would continue to keep them extended, without finding any paſſage out.

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rative refraction of a liquor, when a greater quantity of the ſame ſalt is diſſolvd in it, and when a leſs; as alſo, the refraction of a liquor, when two or more liquors have been diſſolved in it; and the refraction of ſeveral liquors, wherein colours have been diſſolved. Then to proceed to examine the refraction of all kinds of ſolid bodies, as diamonds, cryſtal, glaſs, ice, gummous and reſinous ſubſtances, horn, arſenic, and all other tranſparent bodies; the refraction of ſeveral coloured glaſſes; and to find, by what means the refraction of glaſs may be augmented or diminiſhed, and to examine alſo the refraction and ſtructure of the ſeveral humours and parts of the eye; and to obſerve the refraction of the air of ſeveral denſities; and laſtly, to obſerve what would be the beſt figure and the beſt material to make dioptric lens's.

[e] Original Regiſter, vol. iii. p. 65.

3. “ By thus blowing, I found the lungs to be exceeding large, and to reach “ from the mouth almoſt to more than half the length of its body. The upper “ part next the throat looked like a company of bubbles in a parcel of froth; but “ the lower part looked very thin, clear, and tranſparent, exactly like a bladder, “ without any ſign of diaphragms or partitions. This tranſparent cylindrical “ bladder ſeemed, when thus filled, as big about as the body of the viper, and “ was about ſome four or five inches long: upon pricking which with a point of “ a knife, the whole lungs ſubſided, and could not, by blowing it through the “ *aſpera arteria*, be afterwards filled.

4. “ Upon opening the lungs, I found they were nothing but one continued “ bladder, from the throat to the middle of the belly; not ſeeming to have any “ kind of partition or parenchyma, but only to conſiſt of a very thin ſkin or “ bladder: only the upper part of it looked almoſt like a net, but the under part “ conſiſted of a film, as clear as the bladder of a carp: and examining it with a “ microſcope, I could not find any kind of veſſel or muſcle in it. But,

5. “ Upon examining the upper part with a microſcope, I found, that the net-“ work, I formerly mentioned, was a contexture of veins and arteries, which were “ variouſly implicated and interwoven in the manner of a net; and I could plainly “ perceive all along the ſides of thoſe veſſels ſeveral ſmall chains of bubbles of “ air, which, whether they were ſeparated from the blood to be diſcharged into “ the lungs, or rather whether they were ſeparated from the air in the lungs to “ be mixt with the blood, I was not able by this diſſection to diſcover.

6. “ It was notable alſo, that the *aſpera arteria* reached from the mouth to “ more than half the length of the lungs; and though it were kept open by ſmall “ bended cartilages as in other creatures, yet all theſe cartilages were ſo contrived, “ that the pipe ſeemed to be ſlit on one ſide from top to bottom: that is, each of “ them were bended ſomewhat more than half a circle, but none of them did per-“ fectly meet, and make a circle: A particular providence certainly of nature.”

The preſident gave an account to the ſociety of father BOURGONIS's book againſt Monſieur PASCAL, which his lordſhip obſerved did not ſo much refute Monſieur PASCAL, as introduce another hypotheſis, whereby he could indeed ſolve all the phænomena, but, in the preſident's opinion, not ſo rationally, as it was done the other way; founding the whole upon rarefaction and the *motus nexûs*, an hypotheſis inconceivable to conſidering men[f].

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[f] This laſt paragraph is not entered in the Journal-book of the Society, but taken from Mr. OLDENBURG's letter to Mr. BOYLE of November 24, 1664, cited in the preceding note; in which letter he remarks, that there had been the day before *a noble* appearance at the meeting of the Royal Society, “ and as much life, *ſays he*, as ever I ſaw there. “ And no queſtion this Society would prove a “ mighty and important body, if they had but any “ competent ſtock to carry on their deſigns; and “ if all the members thereof could but be induced “ to contribute every one their part and talent for “ the growth, health, and welfare of their own “ body; which, methinks, is one of the moſt rea-“ ſonable things in the world, and conſequently “ ſhould be eaſy to be perſuaded to thoſe, that “ make profeſſion of reaſon and virtue. There have “ been lately elected into the Society Sir ROBERT “ ATKYNS the younger, Mr GODOLPHIN, Mr. “ BAGNAL, Mr. THYNNE, Mr. HOARE comp-

November 30. Upon this anniverſary day of election of a new council for the year enſuing, there was firſt a report brought of the treaſurer's accounts by the committee choſen at the laſt meeting to examine them, *viz.* that it appeared, that the treaſurer had received from Mr. Balle, the former treaſurer, 17l. 1s. 8d. from Mr. Colwall as a gift 50l. for admiſſions ſince the 15th of December 1663, to the 17th of this preſent November, 35l. 14s. and for weekly contributions, 119l. 1s. 6d. making in all 221l. 17s. 2d. Out of which there had been paid by warrant and allowance of the preſident or council before the 18th of this preſent November, 170l. 15s. 10d. So that there remained in caſh 51l. 1s. 4d. which with the 100l. given by Mr. Balle, and 343l. 2s. being the arrears due from ſeveral members at Michaelmas preceding, made in all 494l. 3s. 4d.

The biſhop of Exeter[g] ſuggeſted, that there being ſuch arrears, a ſtrict order might be iſſued for the collecting thereof.

Mr. Thynne and Mr. Hoare were admitted.

After this the ſociety, being 53 or 54 in number, proceeded to election, according to the order preſcribed in their ſtatutes.

Of the old Council were continued the following eleven,

The lord viſcount Brouncker.
Mr. Howard.
Sir Robert Moray.
Sir Paul Neile.
Mr. Aerskine.
Dr. Wilkins.
Dr. Goddard.
Mr. Palmer.
Mr. Colwall.
Mr. Hill.
Mr. Oldenburg.

The ten new ones choſen in were theſe:

The lord biſhop of Exeter.
The lord Ashley.
Sir John Lowther.
Sir William Petty.
Mr. Slingesby.
Mr. Henshaw.
Dr. Clarke.
Dr. Croune.
Dr. Balle.
Mr. Graunt.

Out of this new election were choſen for officers,

The lord viſcount Brouncker, Preſident.
Mr. Hill, Treaſurer.
Dr. Wilkins } Secretaries.
Mr. Oldenburg }

" troller of the Mint, Mr. Woodford, Sir John " Cutler (Mr. Hooke's benefactor) and yeſterday the Preſident propoſed Mr. Hervey, the " queen's treaſurer, for candidate; inſomuch, that " we are now full one hundred and fifty men. " Mr. Sprat intends to begin next week to " print the *Hiſtory* of our inſtitution, which hath " been peruſed by lord Brouncker, Sir Robert " Moray, Dr. Wilkins, Mr. Evelyn, and " others; but we are troubled, that you cannot " have a ſight of it before the publication. I ſee " the author hath divided his diſcourſe into three " general heads.—I muſt confeſs the ſtyle is excellent, even, full, unaffected: but I know not, " whether there be enough ſaid of particulars; " or, to ſpeak more truly, whether there are performances enough for a Royal Society, that hath " been at work ſo conſiderable a time."

[g] Dr. Seth Ward.

The new members of the council were all ſworn, except the lord Ashley and Sir John Lowther, being both abſent.

This being done, Monſieur Le Febure preſented his printed diſcourſe, both in French and Engliſh, upon the preparation of Sir Walter Raleigh's cordial.

He likewiſe read a Latin letter ſent him from Paris, and ſigned for atteſtation by ſome of the principal phyſicians and chirurgeons of that city, concerning the art practiſed by one Monſieur Bienaise, of healing tendons and nerves tranſverſly cut, ſo as to reſtore the patient to the full uſe of his limbs. He was deſired to leave the letter with the ſociety, which he promiſed to do, after he had ſhewn it to ſome of the college of phyſicians.

December 7. At a meeting of the Council were preſent

The lord viſcount Brouncker,
  preſident.
The lord biſhop of Exeter.
Mr. Howard.
Mr. Aerskine.
Sir Paul Neile.
Sir John Lowther.
Sir William Petty.

Mr. Slingesby.
Mr. Henshaw.
Mr. Palmer.
Mr. Hill.
Mr. Colwall.
Dr. Balle.
Dr. Croune.
Mr. Oldenburg.

Sir John Lowther was ſworn as member of the council.

The treaſurer, Mr. Hill, and both the ſecretaries, Dr. Wilkins and Mr. Oldenburg, were ſworn as ſuch.

Dr. Wilkins propoſed Mr. Hooke as candidate for a curator's place.

It was ordered, that Mr. Hooke be not examined as curator.

It was ordered, that Sir William Petty, Dr. Wilkins, and Mr. Graunt draw up a form concerning the name and ſubject of Mr. Hooke's lecture, and ſhew it to Sir John Cutler, the founder thereof, to receive his thoughts upon it.

It was ordered likewiſe, that Dr. Wilkins do produce the catalogue of the entries of the ſociety's Regiſter-books, as it was given in by Dr. Merret.

It being ſuggeſted, that there were ſeveral perſons of the ſociety, whoſe genius was very proper and inclined to improve the Engliſh tongue, and particularly for philoſophical purpoſes; it was voted, that there be a committee for improving the Engliſh language; and that they meet at Sir Peter Wyche's lodgings in Gray's-Inn, once or twice a month, and give an account of their proceedings to the ſociety, when called upon.

The perſons following, or any three, or more of them, were nominated to conſtitute this committee:

Mr. Aerskine.
Sir Robert Atkyns.
Mr. Austen.
Sir John Birkenhead.
Dr. Clarke.
Dr. Croune.
Mr. Dryden.
Mr. Ellise.
Mr. Evelyn.
Sir John Finch.
Mr. Godolphin.
Mr. Henshaw.
Mr. Hoskyns.
Mr. Neile.
Sir Thomas Notte.
Mr. Sprat.
Mr. Southwell.
Sir Samuel Tuke.
Mr. Waller.
Mr. Williamson.
Mr. Matthew Wren.

It was ordered, that this committee at their firſt meeting chooſe a chairman out of their number.

At the meeting of the Society on the ſame day,

Mr. Hervey was elected.

The experiment for the verifying of Monſieur Huygens's rule concerning the univerſal meaſure was made twice, there being taken a very ſmall bullet with a line of the length of $15\frac{3}{10}$ inches; and two wooden balls, one of three, the other of ſix inches; which being adjuſted with the former line, it was found in the firſt trial, that the line of the ball of three inches diameter was $13\frac{1}{2}$ inches long; which added to the ſemi-diameter of the ball made the length of the vibration from the point of ſuſpenſion to be fifteen inches; and the line of the ball of ſix inches diameter was twelve inches long, which added to the ſemi-diameter of the ball, made the whole length to be fifteen inches. In the ſecond trial it was as before, except that the pendulum with the ball of three inches was adjuſted to $13\frac{11}{20}$, to make it vibrate equally with the other two.

This being calculated and compared with Monſieur Huygens's rule, was found to approach very near to it.

Mr. Hooke was ordered to attend the preſident on the Friday following, to adjuſt the pendulum to vibrate ſeconds.

The lord Brereton preſented a book written by Joseph Glanvill, M. A. intituled, *Scepſis ſcientifica: or confeſt ignorance the way of ſcience, in an eſſay of the vanity of dogmatizing and confident opinion*[b], dedicated to the Society; the dedication of which[1] was read.

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[b] Printed at London 1665, in 4to. The ſubſtance of this book was publiſhed at London 1661, in 8vo, under the title of, *The vanity of dogmatizing, or confidence in opinions: manifeſted in a diſcourſe of the ſhortneſs and uncertainty of our knowledge and its cauſes.*

[1] In it Mr. Glanvill expreſſes a very great reſpect for the Society and its deſign; "which, "says Mr. Oldenburg in a letter to Mr. Boyle, "dated December 10, 1664 (Boyle's Works, "vol. v. p. 328.) I was very glad, and ſo were "others, to find to be ſo well underſtood at laſt "by ſome, though, I fear, the great expectation "he raiſeth of their enterpriſe may be of more "prejudice than advantage to them, if they be "not competently endowed with a revenue to "carry on their undertakings."

Mr. Glanvill, the author, was propoſed candidate by the lord Brereton.

Thomas Rolt, eſq; was likewiſe propoſed candidate by Dr. Wilkins, to whom he was recommended by Dr. Coxe, who could not himſelf be preſent to propoſe Mr. Rolt.

Mr. Hooke gave ſome account of the experiments of refraction made by him ſince the laſt meeting with ſolutions of vitriol, ſalt-petre, and alum, in water; where he had found the refraction of the ſolution of vitriol and ſalt-petre a little more, but that of alum ſomewhat leſs, than common water.

It was ordered, that at the next meeting the whole tube of the refracting inſtrument be filled with the liquor, the refraction of which was to be examined, and the glaſs be put at the lower end, exactly ſet at right angles to the tube; as alſo, that theſe experiments be made with ſeveral quantities of the liquor, and in veſſels of ſeveral ſizes; and that with liquors turbid and coloured as well as clear.

Mr. Henshaw's account of the nature of frogs ſpawn was read, and ordered to be regiſtered[k].

"Having found in the writings of Rondeletius, Paracelsus, and Horstius a paradox, wherein they ſeemed much to boaſt of their diſcovery, not without ſome pity of the ignorance of vulgar naturaliſts; which was, that batrachum, or, as we commonly call it, frog-ſpawn, was a ſpontaneous production of nature, at the very entrance of the ſpring, on the ſurface of all ſtanding ſhallow waters; ſuch as we moſt uſually ſee contained in ditches by the high-way ſide; blaming much the groſneſs of their underſtanding, who could believe any animal was able to emit at once ſo great a quantity of ſperm, as ſhould ſo many times outweigh its own body, as a bunch of frog-ſpawn does the body of a frog: and Paracelsus, in ſeveral of his writings, but more particularly in his treatiſe *De Magno Mundi Maio*, endeavouring to perſuade us, that this frog-ſpawn is the ſperm of the world; and that in the ſpring, when nature does *prurire in generationem*, ſhe every where ſends out this ſperm towards the ſuperficies of the earth, and that thoſe numerous families of inſects, when they begin to ſtir abroad, receive thence a great encreaſe, by an equivocal generation; beſides, that all vegetables are not only by it revived into a new verdure, but have their growth and nutriment from it during the whole ſummer: but that it is never viſible to us, unleſs in theſe ſtanding waters, where at that time are no plants to attract and exhauſt it: that the frogs, by a peculiar inſtinct of nature, do take delight to dabble and wanton in it, and by that means impregnate it with an irradiation of their own ſpecies; telling us farther, that a ſkilful artiſt, by the adaptation of a proper encheiria, may be able to do wonders out of this univerſal ſperm:

"This pompous way of philoſophizing begat no leſs curioſity in me, to try what diſcoveries I could make concerning the production of this frog-ſpawn; by ap-

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[k] Original Regiſter, vol. iii. p 67.

" plying my own obſervation to attend its birth at the proper time of the year. " In order whereunto, I did ſome years ſince ride out towards the end of February, at which time (unleſs the weather be very cold and froſty) the frogs do " leave their winter-quarters, to viſit the light again. I had in my company a " friend, who by the authority of the forenamed authors was wholly gained over " to their opinion. We rode not far ere we came to a place, where there was a " vaſt number of frogs creeping about on the ground, at a little diſtance from a " ditch ſide: they were almoſt all coupled together in the act of generation; the " female moving up and down with the male on her back, clinging cloſe to her, " and claſping his fore legs under her throat. I did obſerve, that the females were " larger than the males, and ſomething different from them in colour. After I " a while conſidered them, I took up into my hand a pair of theſe frogs thus " coupled, and having with ſome difficulty ſevered the male from her, I cut " open the belly of the female with a pen-knife, where I found a bunch, not ſo " big as my thumb, of thoſe black round eggs (which are always ſeen in the frog's " ſpawn, though of a larger magnitude, and at a greater diſtance) ſtrongly ſticking together, by a whitiſh glutinous ſlime, that was about them, and which, having handled them a little, ſtuck ſo faſt to my fingers, I could hardly rub it off. " The frog died almoſt as ſoon as I had opened her belly; but my friend being " not ſufficiently convinced with the demonſtration, I took the frog, and laid her " into the water near the brink of the ditch that was by, to ſee what effect the " water would have on her eggs; and then riding on to take the air, about an " hour and an half after we came back, and found the frog turned in the water " on her belly by the weight of her eggs, which were now grown almoſt to the " ſize of any bunch of frog-ſpawn we could find in the ditch; and that white " ſlime, which held the black eggs together, being dilated and ſwelled with the " water, was grown to a ſofter mucilage, not ſo glutinous, and very tranſparent: " and to expreſs all in a word, it was in all circumſtances exactly reſembling the " common frog-ſpawn."

Mention being made, that the catalogues of trades, formerly brought in by Dr. MERRET, might be looked over by the members, in order to chooſe out of them ſuch as they would give the hiſtory of, and the biſhop of Exeter intimating, that he had a printed catalogue of that kind, he was deſired to compare the written with the printed one, and to make additions, if he ſhould meet with any thing omitted therein; which he promiſed to do.

It was ſuggeſted, that it would be convenient to have this catalogue printed.

A review being made of what experiments of cold were ſuggeſted the winter preceding, but left untried, it was found, that the following were then propoſed, but not made: 1. To make a ſtandard of heat and cold by obſerving the preciſe degree of cold, which freezeth common diſtilled water, and by marking thereupon the expanſion of the liquor of the thermometer. 2. To include a loadſtone in ice, in order to ſee what alteration it produces either in its attractive or directive virtue, or in both. 3. To reduce water into ice without blebs; and then to try, whether ſuch ice, ſhaped into a cone, would ſerve for a burning-glaſs. 4. To put water into the receiver of the pneumatic engine, and having exhauſted it, to let it freeze there, to ſee whether it becomes a clearer ice.

It was ordered, that theſe experiments ſhould be made by Mr. Hooke, when the weather ſerves:

That he bring in the ſcheme for the inſtrument to meaſure the refraction, which the celeſtial bodies ſuffer in the air:

That he have his quadrant made for diſcovering a ſecond minute by the ſtars: And

That he try at the next meeting Monſieur Huygens's way of a thermometer with a cane of ſalt-water and a glaſs-ball ſwimming in it.

Mr. Howard produced a French paper about ordering of vines, ſent him from Sir Samuel Tuke out of France; which was ordered to be tranſlated into Engliſh against the next meeting.

December 14. At a meeting of the Council were preſent,

The lord viſcount Brouncker, preſident.
Mr. Howard.
Sir Robert Moray.
Sir Paul Neile.
Sir William Petty.
Mr. Aerskine.
Mr. Henshaw.
Mr. Palmer.
Dr. Wilkins.
Dr. Goddard.
Dr. Clarke.
Mr. Hill.
Mr. Graunt.
Mr. Oldenburg.

Sir William Petty made a report, that Sir John Cutler, intending a particular kindneſs to Mr. Hooke in founding the new lecture, and beſtowing upon him as reader fifty pounds *per annum*, deſired, that he might not be more burthened than the other readers of Greſham-College are, but read only as many lectures in the vacations, as they do in term-time: and farther, that Sir John Cutler had intimated, that the management of this lecture by the Society, during Mr. Hooke's life, ſhould be a meaſure to him, to make it perpetual, or not.

Hereupon the ſubject and number of theſe lectures were much debated; and it was agreed upon, that the ſubject of them ſhould be the *Hiſtory of Nature and Art:* but with regard to the number of the lectures, it was not reſolved upon, ſome urging, that Mr. Hooke ſhould be ordered to read once upon all the ordinary weekly meeting-days of the vacations, except thoſe of the three months of Auguſt, September, and October, the greater part of half an hour, beginning about two of the clock: others preſſing, that Mr. Hooke might read but as many lectures as other profeſſors do; and that the reſt of the Wedneſdays might be left to be endowed by ſome other benefactor for another philoſophical profeſſor.

At the meeting of the Society on the ſame day,

Mr. Glanvill and Mr. Rolt were elected and admitted.

Sir Nicholas Slanning was propoſed candidate by Mr. Evelyn.

There was read an account of the culture of vines ſent from Paris by Sir Samuel Tuke to Mr. Howard; which was ordered to be filed up.

The experiment mentioned by Monſieur Huygens of making a thermometer with a cane of ſalt-water and a glaſs-ball poiſed in it, was tried; and it was found, that the glaſs-ball roſe and ſubſided, according to the alterations of heat and cold. It was ordered, that it be kept and compared with the other thermometers, in order to ſee whether it be ſo nice and ſenſible as they.

There was read a paper ſent from Oxford by Mr. Boyle to the ſecretary, containing certain propoſals of Mr. Austen, about the planting of fruit and timber-trees, which Mr. Austen deſired might be recommended to the parliament. It was referred to the committee for agriculture to conſider of it.

There was alſo read an extract of Mr. Boyle's letter to the ſecretary, containing experiments of cutting in dogs the ſixth pair of nerves, called *par vagum*; whereupon the pulſe was quite altered and intermitted, and the dogs continued near four days alive, though under great diſcompoſure.

Sir Robert Moray mentioned, that Dr. Wren had formerly promiſed to Sir Paul Neile and himſelf, to communicate to him his lectures read at Greſham-College upon the dioptrics; and moved, that he might be deſired to bring the ſame into the ſociety; which requeſt was made accordingly.

Sir Robert Moray made a report, that Sir Ellis Leighton being ſpoken to by him, according to the order of the ſociety, had promiſed him, that he would take a ſpecial care of procuring for the ſociety what natural productions could be obtained from Guinea.

Dr. Goddard gave ſome account of Dr. Henshaw's book, intitled, *A Regiſter for the Air*, which he had been deſired to peruſe, *viz.* that the main point, which the author ſeemed to aim at in it, was to deliver a new method of changing the air, without removing from one place to another, by means of an air-chamber fitted for that purpoſe. And that he ſeemed to conſider only in the air its denſity and rarity, in order to the health of men: but that phyſicians conſidered other qualities therein, in relation to mens bodies.

Dr. Ent took notice, that the author of this book made reſpiration chiefly ſerve for the ſpeedier circulation of the blood from the one ventricle to the other: but Dr. Ent added, that all phænomena did not agree with this hypotheſis.

The experiment of Monſieur Huygens for the univerſal meaſure was repeated twice; and the firſt time the ſtring of the biggeſt ball (which was of ſix inches diameter) was 2 feet $11\frac{4}{5}$ inches long; and that of the ſmaller ball was 3 feet $1\frac{1}{5}$ inch long. The preſident having calculated the proportions, according to Monſ. Huygens's rule, found them vary from it $\frac{1}{10}$, the ſtring of the ſmaller bullet being $\frac{1}{10}$ longer than it ſhould be, according to that hypotheſis. In the ſecond trial the difference was yet greater, *viz.* $\frac{1}{10}$ or $\frac{1}{30}$ or $\frac{1}{13}$, which was thought too conſiderable a difference for a ſtandard.

It was hereupon concluded, that there muſt be either ſome miſtake in the rule, or ſome fault in the experiment.

The preſident hinted, that the difference of the air and the bullet might vary the length of the line. So that a ſmall bullet in a clear air, and a great bullet in a thick air, would cauſe different meaſures.

Mr. Hooke ſuggeſted, that it would be beſt to make pendulums of the ſhorteſt length, conſidering, that a little variation in length makes a great alteration in time.

He produced a paper, containing ſome conſiderations of his about the moſt likely way of ſettling an univerſal meaſure; which was ordered to be regiſtered[1], ass follows:

" It ſeems to me, that the moſt convenient ſubſtance of a pendulous body for " this purpoſe ſhould be ſome one ſimple or unmixt metal, ſuch as refined gold, " refined ſilver, clean copper, tin, lead, or iron; for thereby all the parts of it " will moſt likely be of an equal denſity and gravity: whereas if it ſhould conſiſt " of two diſtinct ſubſtances, there might ariſe ſome inconveniency from the diſ- " proportionate gravities or denſities of theſe two bodies, in reſpect of others the " like; as if part of the pendulous body was made of iron, part of tin, the pro- " portion between divers ſorts of iron and divers ſorts of tin being not always the " ſame, might create ſome irregularity.

2. " The moſt convenient ſhape ſeems to be ſome kind of priſmatical body, by " which I mean any kind of body, that may be ſuppoſed to be made up of an in- " finity of equal polygonal ſuperficies or thin plates, placed directly one upon ano- " ther; ſuch as a triangle, ſquare, rhombus, pentagon, hexagon, circle, &c. cut at " right angles out of an equally thick plate of any very clean metal, and vibrat- " ing on any one corner or determinate part of it edgwiſe: for by this means it " will be no matter how thick the plate be, whether the hundredth part of an " inch, or an hundred inches.

3. " As to the time, to which the vibration of ſuch a pendulous body ſhould " be adjuſted, the ſhorteſt time ſeems the beſt; firſt in reſpect of the make and " ſubſtance of the pendulous body, being much more eaſily made of a ſmall figure

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[1] Original Regiſter, vol. iii. p. 69.

“ than of a larger: but next, and chiefly, in reſpect of the time; for the length of regular pendulous bodies being in a duplicate proportion to their times, the greater the length is, any ſmall error in the time makes the error in the length the greater; and therefore, a pendulous body, that vibrates ſeconds, is much better than if we could have a pendulum to vibrate minutes; and one to vibrate every eighth part of a ſecond is much better than one to vibrate ſeconds, or any longer time. And an error in one eight times ſhorter will be 64 times more eaſily diſtinguiſhed than in the longer; that is, the ſhortening or lengthening the ſhorter pendulum $\frac{1}{64}$ of an inch will make as ſenſible a variation in the time, as lengthening or ſhortening the whole an inch.

“ But whether this will afford us an exact ſtandard of the meaſure of ſpace or extenſion, may ſeem dubious from theſe particulars:

“ Firſt, from the nature of the motions of the heavens; for though it be generally preſumed, that their motions are ſo conſtant, as to make their revolutions now, in the ſame ſpace of time they ever have done, and ever will do: yet it is poſſible their revolutions may have been ten times as ſwift as now they are, and that they may in time be moved yet ſlower. For as we find here upon earth, the circular motion of a wheel, or top, or any the like turbinated body, which receives any kind of impediment from the medium, in which it is moved, or from any other external accident, is by degrees made much more ſlow, than when it received its laſt impulſe; ſo may the celeſtial bodies, ſince their firſt impulſe they received at the creation, that ſet them in motion, be, by the impediment of the medium, through which they paſs (though it ſeem the moſt fluid ſubſtance in the world) ſo impeded, that they may have loſt very much of their firſt velocity: ſo that perhaps the men of the firſt age of the world, before the flood, might live no longer time than men do now, though they might ſee and number ten times more revolutions of the ſun and heavens. Which if it ſhould be ſo, the length of a pendulum to vibrate a ſecond of time, reckoned by the revolution of the heavens at the beginning of the world, would have been found but a hundredth part of the length we find now fit for that purpoſe; and perhaps, if the motion of the heavens wax ſlower, the length of ſuch a pendulum muſt be much more increaſed.

“ Secondly, From the nature of the principle, that moves the pendulum: for if the gravity of the earth be altered, either by time or place, all endeavours of making a ſtandard this way will be in vain; for whenſoever and whereſoever the gravity of the earth is ſtronger, there muſt the length of a ſecond pendulum be much longer; and when and where it is weaker, there muſt it be ſhorter. The reaſons, that may make each of theſe probable, ſeem to be theſe:

“ Firſt, That all bodies and motions in the world ſeem to be ſubject to change, of which we may find inſtances, even in the very ſun itſelf.

“ Next, We find, that the magnetical properties of the earth do in a very little time alter, and are ſometimes more, ſometimes leſs intenſe; and the line of di-

" rections and the point, to which it tends, ſeem to be varied with ſome irregular " motions: if therefore the gravitation of the earth be magnetical, that may " alſo alter.

" Thirdly, If the gravity of the earth do any way depend upon the magnetic " virtue of it, it is poſſible that property may be ſtronger toward the pole than " about the equator (for we find the attractive virtue of the loadſtone to be ſo); " and if ſo, the ſtandard by a pendulum will be uncertain, becauſe a ſecond pen- " dulum toward the poles will be much longer than near the equator."

He gave alſo ſome account of what he had done at the lord viſcount Brounck-er's houſe in adjuſting the pendulum to vibrate ſeconds, *viz.* that his lordſhip's pendulum vibrating juſt ſeconds, went a little quicker than thoſe tried at Greſham-College for ſeconds; and that the length of the pendulum for ſeconds at his lordſhip's was 3 feet $1\frac{2}{5}$ inch, and the ball of three inches diameter.

The experiment of trying the refraction of common water by filling the whole tube of the refracting inſtrument with it, was tried; and it was found, that it agreed with the uſual way of trying the refraction of that liquor.

Mr. Hooke produced the ſcheme for the inſtrument of meaſuring the refraction of celeſtial bodies; which was ordered to be regiſtered [m].

December 21. At a meeting of the Council were preſent

The lord viſcount Brouncker, preſident.
Sir Robert Moray.
Sir Paul Neile.
Sir John Lowther.
Mr. Aerskine.
Mr. Slingesby.
Dr. Goddard.
Mr. Balle.
Mr. Oldenburg.

The preſident moved, that licence might be granted to Dr. Charleton for the printing his book *De puero fulmine icto, & de cerebro* [n], by the printers of the Society.

It was ordered, that this licence be granted, but that two paſſages in the preface be left out, or altered to the ſatisfaction of the preſident, before the book be licenſed:

That the council be ſummoned againſt the Wedneſday following at ſix in the evening, to conſider of the recommending a curator to the Society: And

That Dr. Wilkins, Dr. Goddard, and Dr. Croune be a committee to conſider of the particulars to be inſerted in the relation of the Society's inſtitution [o].

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[m] It does not appear in the Regiſter.

[n] This book was publiſhed at London 1665. in 8vo. under the title of, *Diſquiſitiones duæ anatomico-phyſicæ, altera anatome pueri cœlo tacti, altera de proprietatibus cerebri humani.*

[o] By Mr. Sprat.

At a meeting of the SOCIETY on the ſame day,

Sir NICHOLAS SLANNING was elected:

Sir WILLIAM PORTMAN, knt. bart. and knt. of the Bath, was propoſed candidate by Mr. GRAUNT: And

Sir WINSTONE CHURCHILL by Sir WILLIAM PETTY.

There were read three ſeveral accounts of the comet lately ſeen[p], one by Sir ROBERT MORAY, as he obſerved it December 17 at Whitehall; another ſent from Portſmouth, as it was ſeen by the earl of SANDWICH on board of the London at Spithead; a third ſent from Ireland, as it was ſeen at Dublin by Mr. KEARNEY and another gentleman ſeverally, both agreeing in their obſervations.

Every member of the ſociety was deſired to make farther obſervations as exactly as they could, and to communicate them.

Mr. PALMER produced a certain compounded metal, which he ſaid was uſed by a gentleman to take off a ſeal from Spaniſh wax, by ſoftening and working it into the ſeal after ſuch a manner, that it received the perfect impreſſion thereof; which done he could harden the metal, and withal reduce it to a leſs volume.

The ſecretary produced ſeveral pearls fiſhed up in Cardiganſhire in Wales, in the river Tivy, ſome of which was as big as ordinary peaſe; others as fair as oriental ones; but many altogether brown, one of which being broken appeared to have a little ſtone in it, ſevered from a ſuperinduced cruſt. It gave occaſion to diſcourſe of the poſſibility of whitening and giving a luſtre to pearls. Mr. HENSHAW mentioned, that having opened ſome oriental pearls of an ill colour, and found a blackiſh dirty ground in them, he thence concluded, that it was in vain to endeavour to make them ſhine. Mr. HOSKYNS added, that he had once removed the outer ſkin of an oriental pearl, and found the body underneath as yellow as gold, and under that a pearl of a very good luſtre.

Mr. HOOKE was ordered to ſhew the ſociety ſuch pearl coloured glaſs, as he had made formerly.

There were tried two wooden circular pendulums, one after another, hung by the edge; one of 18, the other of 9 inches diameter, with a ſmall pendulum of $\frac{3}{4}$ the length of the diameters of thoſe wooden circles; and it was found, that this ſmall pendulum of the ſaid length was iſochrone to the vibrations of thoſe wooden circles, according to Monſieur HUYGENS's rule.

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[p] Mr. HOOKE in a letter to Mr. BOYLE dated December 15, 1664, and printed in Mr. BOYLE's Works, vol. v p. 513. ſays, "We had yeſterday "from ſeveral parts of England an account of the "appearance of a very great comet in the ſouth-"ſouth-eaſt, with a very long tail extended to-"ward the north-weſt, ſome ſay about ten yards "long, ſome about two; but how much that is, "is difficult to gueſs, unleſs we could ſee it, which "I have done all this laſt night, but to little pur-"poſe, by reaſon of the thickneſs of the air."

Sir William Petty, Dr. Wilkins, and Mr. Hooke were deſired to repeat by themſelves in a very ſtill room Monſieur Huygens's experiment for the univerſal meaſure; the experiment made twice in public having varied from his rule by $\frac{1}{16}$ the firſt time, and $\frac{1}{15}$ and $\frac{1}{13}$ the ſecond time.

Mr. Hooke was ordered again to attend the preſident at his houſe for adjuſting the pendulum to vibrate ſeconds, it being doubted, whether the note of the preceding meeting about that particular was rightly taken.

He was likewiſe ordered to make a ſhort pendulum, as beſt for keeping the time exactly.

The propoſal for planting timber and fruit-trees was ordered to be recommended to ſuch perſons of the Society, as were members of the parliament.

Mr. Boyle gave the Society an account of ſome experiments and obſervations made by him at Oxford. The firſt was tried upon a dog, by making a hole in each ſide, big enough to put one's finger in, in ſuch a place, where the finger might reach the nerves, that go to the diaphragm; one of which nerves being broken with the finger, the dog immediately fell into a ſwoon, and ſeemed to be quite dead; but after a while recovered by degrees, having many convulſive motions about the mouth, when he was well come to himſelf again. The nerve on the other ſide being broken, the dog preſently fell into univerſal convulſions, and immediately died in them. The cauſe of which, as Mr. Boyle conceived, was not the wound in the thorax, which was but ſmall, and ſhed but little blood; ſo that at the ſame and at other times too, he kept dogs alive ſeveral days with a greater wound in the thorax; nor was there, added he, any rupture in the pericardium, from which theſe nerves paſs, as he found by diſſection afterwards.

Another experiment was that, which he had communicated by letter taken notice of in the journal of the preceding meeting, and farther to be proſecuted by him.

A third was of putting volatile and acid ſalts into warm ſheep's blood; the effect of which was, that the volatile ones, as ſpirit of ſal armoniac, urine, and hart's-horn, render the blood florid, and keep it uncongealed and ſweet, as long as one pleaſes, heightening alſo the colour. Spirit of wine doth the like, but without heightening the colour. Oil of turpentine likewiſe being ſhaken with the blood preſerved the colour, and kept the blood ſweet, but not like the former. On the contrary, acid ſpirits, as that of ſalt and of nitre, being in a ſmall quantity put into the blood, and ſhaken therewith, coagulated it immediately, and changed it into a dirty colour.

The experiments appointed for the mext meeting were of refractions and pendulums.

December 28. At a meeting of the COUNCIL were preſent,

The lord viſcount BROUNCKER, preſident.	Mr. PALMER.
	Mr. HENSHAW.
Sir ROBERT MORAY.	Dr. GODDARD.
Sir PAUL NEILE.	Dr. CLARKE.
Sir JOHN LOWTHER.	Dr. BALLE.
Sir WILLIAM PETTY.	Mr. COLWALL.
Mr. SLINGESBY.	Mr. GRAUNT.
Mr. AERSKINE.	Mr. OLDENBURG.

The council approved of Mr. HOOKE as curator, in order to recommend him to the Society as ſuch; and it was ordered, that the preſident be deſired to recommend Mr. HOOKE from the council to the Society at their next meeting as curator by office: And

That the amanuenſis cauſe bills to be printed for ſummoning the Society on the 11th of January for the election of a curator, and that the operator carry ſuch bills abroad accordingly.

At the meeting of the SOCIETY on the ſame day before that of the council,

Sir WILLIAM PORTMAN and Sir WINSTONE CHURCHILL were elected.

Sir ROBERT MORAY produced his own and Mr. SLINGESBY's obſervations on the comet, which they were deſired to continue; and other members to do the like. Sir ROBERT communicated likewiſe ſome obſervations on the ſaid comet made at Doway and Bremen; as alſo ſome that were made in Wiltſhire from November 13 to December 17.

Dr. PELL, upon occaſion given by Sir ROBERT MORAY, mentioned, that he had at his country houſe in Eſſex a wooden hoop, made by his directions in the year 1645, of twenty inches broad, repreſenting the ecliptic, and at Amſterdam by Mr. BLEAU lined with as much of the paper of Mr. BLEAU's largeſt globes, as comprehends all the fixed ſtars within 10 deg. of the ecliptic on either ſide, but with the conſtellations inverted, as they ſtand in the heavens; the uſe of this being not only to help young obſervators, but alſo for the genuine repreſentation of the variety appearing in the motion of the planets.

He mentioned, that he was willing to leave it with the Society, when they ſhould have a fit repoſitory to keep ſuch inſtruments in.

An experiment was made with a circular plane, hanging by a ſtring of $17\frac{3}{4}$ inches, the radius of the circle being 9 inches; ſo that the diſtance from the center to the point of ſuſpenſion was $26\frac{1}{4}$ inches. Which being calculated by Mr. HOOKE, according to his rule, gave the diſtance from the center of vibration to the point of ſuſpenſion $27\frac{3}{4}$ inches, whereas it ſhould have given $28\frac{3}{16}$ inches.

Mr. Hooke acquainted the Society, that he had been adjuſting at the preſident's houſe the pendulum vibrating ſeconds; and that his lordſhip and he, though meaſuring by the ſame ſtring, yet could not determine the exact length, becauſe the ſtring broke, which made them differ, his lordſhip finding 39 inches wanting $\frac{1}{10}$, but Mr. Hooke 39$\frac{1}{10}$ inches.

Mr. Hooke brought in his obſervations of the comet on December 23 in writing; whence he concluded, that this was the ſame ſtar, that had appeared about a week before. He added, that it ſeemed to be a body, that was diſſolved in the æther; and that the parts, that were diſſolved, aſcended from its body directly oppoſite to the ſun, or from the gravitating center of the planetary ſyſtem, after the manner, in which ſmoke from a burning body aſcends upwards from the center of the earth. He exhibited alſo a ſcheme of the hypotheſis, whereby he conceived, that all the irregular motions of the ſtar towards the weſt, which it had hitherto been obſerved to make, might be explained by the motion of the earth, without aſcribing any or but very little motion to the comet. He was ordered to continue his obſervations with all diligence and exactneſs, and to ſee, whether they and thoſe of others would all agree with the ſaid hypotheſis, and to bring in an hiſtory of all in writing.

Mr. Boyle's late anatomical experiment of breaking the nerves going to the diaphragm, and thereby killing a dog, being mentioned again, he was deſired, together with Dr. Clarke, to ſee the experiment made before the Society; and the operator was ordered to provide a pretty large dog for that purpoſe.

With regard to the other experiment made by him of cutting in dogs the ſixth pair of nerves, he deſired time to purſue it, before he gave a farther account of it.

The operator brought in writing his obſervations of the baroſcope, made by him for the ſpace of a whole year; which was referred to the next meeting.

End of the Firſt Volume.

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ERRATA.

Page 1. note (e) col. 2. line 2: for *peragrârunt* read *peragrârant*. Page 3. paragr. 2. line 3. for *et* read *and*. Page 99. line 9. for ROBRT read ROBERT.

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